

# HIFICRITIC

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The Pro-Ject founder on how his company started, and why success is all about offering choice

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British-designed, this all-in-one streaming system is quite a looker – and sounds pretty special, too

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**SUPER  
CHRONOSONIC**  
*Martin Colloms gets  
to grips with the mighty  
Wilson Audio Chronosonic XVX  
loudspeaker – and  
finds it takes music to  
new heights*



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# The entry ticket to a \$1m hi-fi system

MARTIN COLLOMS LISTENS TO WILSON AUDIO'S CHRONOSONIC XVX, THE VERSION OF THE COMPANY'S \$850,000 WAMM MASTER CHRONOSONIC RE-IMAGINED BY DARYL WILSON, SON OF LATE COMPANY FOUNDER DAVID. DOES THIS 1.87M TALL, 311KG MULTI-DRIVER BEHEMOTH CONTINUE MARTIN'S ONGOING APPRECIATION OF THE BRAND'S SOUND?

**In my infrequent but always stimulating encounters with Wilson Audio founder David Wilson, I found him to be ambitious, fearless, creative, inventive, painstaking, determined, discriminating, and highly driven in his pursuit of a satisfyingly realistic acoustic recreation of a sound scene. With a background in medical engineering research, combined with a deep appreciation of music, such early experiences initially led to an ambition to become a recording engineer. As such his legacy includes numerous fine audiophile recordings made with state-of-the-art equipment.**

However, it was clear that some of the necessary attributes of a loudspeaker system designer were also in place. As a keen judge of sound quality, his skills in this area were honed by written submissions of audio equipment reviews for *The Absolute Sound*, a left-field High End audio journal, pioneering the publishing of equipment reviews which actually discussed sound quality, a rarity in those days.

Highly observant, and fully aware of the qualities of live sound, the first loudspeaker design he presented to the public, the WAMM, was both massively ambitious and highly original design. This 'Wilson Audio Modular Monitor' was first fielded in the USA forty years ago, the result of extensive and almost obsessive research into available loudspeaker resources: it was an extraordinary design, and well-regarded even now. David had mastered not just the fundamentals of design, but also how, when installed, a loudspeaker should be voiced to sound as lifelike as possible.

WAMM was biamplified, the low-frequency systems being built to a heroic subwoofer standard, each using a huge 46 cm driver mounted in a free-standing partnering enclosures to take the low frequencies to a ground-breaking 17Hz -3dB. They were – and are – capable of considerable body-shaking acoustic power, the WAMM system using an adjustable electronic crossover to help fine-tune the installation at low frequencies.

The main enclosures, realised as tall vertical lines, allocated the upper bass to a set of two KEF B139 'racetrack' piston units, mounted horizontally in the lowest enclosure, while a central array of

electrostatic wide-angle high frequency drivers covered the upper treble, the drive-units being sourced from Janzsen, an American pioneer of this technology. Above and below this electrostatic array, a pair of spaced enclosures housed 100mm midrange drivers and 25mm lower treble units. For the original WAMM the total system weight for all four towers was 750 lbs (340 kg). The material and structures now employed are heroically denser, and more complex than before. A key design feature was the adjustable fore and aft alignment of the upper array of drivers, to allow focusing of the first sound arrivals – the leading sound impulse 'edges' – at the listener location for improved focus and dynamic realism, for which Wilson was awarded a patent.

In 1983 the WAMM cost approximately \$42,000, to which needed to be added the price of the necessary biamplification, so West Coast music barons were the likely customers. Wilson's ambitious objective was nothing less than the impression, the experience, of a full orchestra in an appropriate listening room. I wondered whether the team led by his son Daryl – who took over the running of the company a couple of years before his father's untimely death in 2018 after a long battle with cancer – had managed to repeat the exercise with the Chronosonic XVX under consideration here, which retails for £348,000.

Based on David and Daryl's development of the WAMM concept into the WAMM Master Chronosonic, priced at \$850,000 and built as a limited edition, the Chronosonic XVX is the 'standard' version of that design, available as part of the company's main range, available in a choice of standard 'WilsonGloss'





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finishes. A range of upgrade finishes command a 5% premium or, for an extra 10%, you can have the speakers in any colour you want.

Here's how Daryl explains the naming of the design: 'The Chronosonic part comes directly from the WAMM Master Chronosonic – time and sound – while the XVX part has an interesting meaning for me: I think of it as taking you to music experiences where X is for the past, a V is planted in the present while the final X is for the future.'

To be fair the Chronosonic XVX isn't in a direct line from the X-1 Grand SLAMM, my experiences with which speaker, and its designer, I recall in the sidebar. It inherits many genes, but strictly speaking is a successor to the more recent Alexandria XLF, but enhanced with Master Chronosonic technology.

However, with higher rigidity and greater density of panel construction, together with augmented internal bracing, even this smaller Chronosonic weighs almost a third of a metric ton per speaker. It's just as well that it disassembles into smaller units for transit, though the low frequency section remains a massive heft, reflecting its ability to drive larger spaces to substantially realistic sound levels.

#### Subwoofers optional

While not used for this review, the full-specification Chronosonic XVX system includes two freestanding Subsonic subwoofers, together with their ActivXO electronic crossover. These will then extend the system response a massive whole octave, down to a near earthquake frequency 10Hz. Each floor standing Subsonic employs three 33cm high power double-suspension drivers, bass reflex loaded, and with these powered up you will certainly feel the full low frequency presence and dynamic range of recording spaces.

We have noted in the past that with every significant extension of the low frequency bandwidth, there are subtle gains in presence, tune playing, low frequency envelopment and that elusive sense of power and grip. Useful reductions

in group delay and improved subjective timing also come with such increased low frequency reach.

Depending on finish, these heroically powerful subs could add a further £100,000, depending on whether you add one or two Subsonics or go for the evocatively-named Thor's Hammer sub. You'll also need the Subwoofer Controller, which retails at £4,498, for crossover purposes, and of course extra power amplification for the sub(s), which ideally should be commensurate with the amps used for the main speaker systems.

Without a doubt all this would add a further sense of scale and low frequency drama in larger spaces, but the Chronosonic XVX loudspeaker alone is pretty powerful down to a very low 17Hz.

#### Seven drivers per speaker

One might expect that to be the case, as it employs seven drivers per side, starting with 32cm and 27cm bass drivers: there are two 18cm lower midrange units, a 10cm for the upper mid and two 25m tweeters – one firing forward, the other to the rear.

The drivers are arranged in a mildly concave – and adjustable – vertical array: it's a form of curved line, wavefront 'focused' and consonant with the inherent relative delays from each driver in conjunction with the crossover network.

Inspired by the influential mid 1970s DQ10 design of ex-aerospace engineer Jon Dahlquist, David Wilson noted that aligning the leading edges of the first transient audio signals for their synchronised arrival at the listener seated head position increased definition and dynamic realism, and this technique was incorporated in the WAMM. This process was translated into the familiar and versatile fore and aft alignment provision now present for fine tuning the position of the upper deck of Chronosonic drivers relative to the listener.

The rear/upward firing tweeter operates at a significantly lower sound level, to smooth and extend the overall power response in the room, balancing the predominantly forward-directed high frequency radiation of the other drivers. This supplemental driver was also a feature of the original X-1, where it was found to add a subtle sense of air, for a more natural room sound. When adjusted optimally for a given room, there is a sweet spot where a sense of openness imbues the room acoustic, expanding the perception of spatiality. The output is continuously variable, calibrated from 'maximum' down to -40dB: too much of it and you hear it working; too little and it's not heard at all.

To facilitate the time-focused alignment of the loudspeaker, each of the sub-enclosures is mounted on stepped ramps of precision machined alloy, which are stabilised with heavy duty point-contact supports. This substantial

David Wilson taking notes on loudspeaker positioning in Martin Colloms's listening room for the Wilson Audio MAXX 3 review, 2009







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machinery, clearly evident in the images, is acoustically and vibrationally inert, has impressive calibration features and is built with a quality of engineering which fully supports the desired acoustic optimisation during installation. These Wilson designs are not off-the-shelf: rather, they are essentially bespoke, and are designed to be optimised, fine-tuned at each and every location where they are to be installed and this local tuning feature adds substantial hidden value.

Cognisant of the launch origins of the acoustic wavefronts radiated by the drivers, the designers have curved the displacement of the driver centres for a better projection of a coherent 'time and phase focused' summation to the listener region, this for the overall acoustic wavefront. This precision alignment during installation reaches beyond a mere adjustment for a preferred frequency response and tonal balance, valuable though these are: other factors such as inherent driver characteristics and the complex delay effects of the crossover network – these affecting relative phase and overall sound output integration – are also taken into account in this final optimised alignment.

### Fine-tuned for imaging

The location and angling of the drivers are also fine-tuned for best image quality – for height, focus, depth and width – in respect of the seated listener, using the built-in micrometer adjustment. Wilson Audio installers are well-trained in this installation procedure, which also includes interaction with several optimal listener locations.

Geometric alignment is facilitated by the incorporation of a custom-built collimated dual-light-ray system developed by Cool Fall, a company perhaps best-known for its manufacture of exotic – and exotically-priced – flashlights: its Spy Tri-V model, for example, is a cool \$8000, and designed for 'uncompromising flashlight aficionados'.

Installation may also include adjustments to the nominal values of the precision Vishay metal foil power attenuator resistors, located in an accessible external array in the external part of the crossover. This adjustment may help to refine the timbre or tonal balance with respect to the customer's audio system and room acoustics, and is a valuable provision which may add as much as 15% to the installed sound quality in some locations.

Perhaps too fussy by half, I often fine-tuned my own Wilson loudspeakers when provided with this facility, to better match my room and audio system, also found it a convenient means of exploring the subjective effects of crossover tolerancing and micro-tuning of a loudspeaker, this both for an article in HIFICRITIC and also in my book on loudspeaker design.

These level-setting resistors also protect the drivers from gross overload, at which point they act as replaceable fuses, easily replaced to restore normal operation at modest cost, in contrast to the costly part-dismantling and replacement drivers for most loudspeaker systems needing repair.

As also found almost three decades ago with the Grand SLAMM X1, while there is substantial complexity in the form and structure, the designers of the Chronosonic XVX – primarily Vern Credille, Senior Engineer, working with creative director and lead designer Daryl Wilson – have been careful to avoid symmetry, and have dramatically opened out the support structures around the loudspeaker modules to minimise cavity resonances and control acoustic diffraction from the overall form.

### Open-form chassis

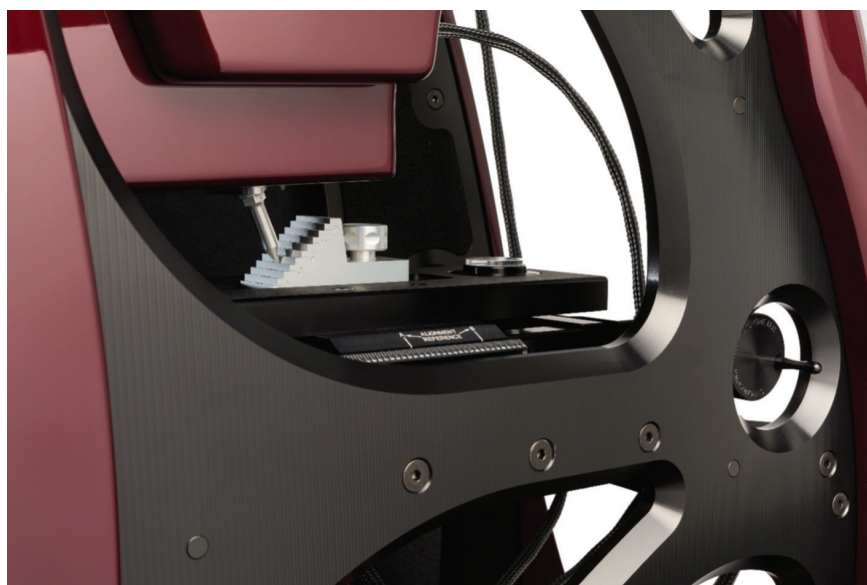
A key aspect is the open-form anti-reflection chassis comprising flanking sidepieces of machined aircraft alloy, supporting the stepped platforms for the array of smaller enclosures. Decorative acoustically transparent grilles may be fitted to the resulting apertures if required, or one can stick with the structure revealed in all its glory.

Remaining audibly transparent at lower volume levels, these larger Wilsons are nevertheless designed to play well at realistically high sound levels, and in big spaces, where the multiple sound sources constituting this system will blend and integrate nicely at the anticipated and naturally greater than usual listener distances. A UK domestic room is typically 80m<sup>3</sup>, while the XVX will drive up to 250m<sup>3</sup> – think in terms of a small dance floor or performance space – but it won't replicate the full experience of a rock concert. Large stage monitors and heavyweight amplification designed to drive them are required for that kind of arduous duty.



*Note the open form, non-reflective side chassis of machined alloy, the foundation for the array of adjustable driver mountings*

*View of the inner alignment 'engine' for azimuth and time delay*



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Full frontal on the upper driver deck

The fusible driver protection resistors and tonal balance adjustment panel



Inheriting the patented displaced dual port feature of the Alexandria XLF, there is provision for the low bass to exit via a large rectangular port at either the front or the back. With the deep enclosure, this allows the movement of the source of the low bass relative to the room boundaries, with the potential for better low-frequency room-matching. For my sonic explorations the rear panel exit was preferred, showing better extension and integration in the test room.

In good hands, with a loudspeaker system of such high potential quality, the huge range of adjustments available here are rather more than the icing on the cake, especially since the micro-tuning process with this design could potentially encompass the entire connected audio system. When fully aligned in this way the improvement gained can be close to transformational, especially when following David Wilson's prescribed method for detailed preparation involving that interactive 'voicing or vovelling' procedure which explores the range of possible optimal locations for loudspeaker and listener in successively refined coordinated stages.

This mighty tower enclosure is provided with the latest energy absorbing, anti-vibration, heavy duty spiked floor couplers, Wilson Acoustic Diodes (from the company's Special Applications Department). I presume the name suggests largely one-way traffic for loudspeaker-generated vibration to be dissipated and finally dispatched via the supporting floor: energy absorption and transfer is improved by using differential material properties, comprising machined aluminium and stainless steel for the outer parts and energy-controlling Wilson grade V-Material for the inner intermediate section.

### Build and Technology

As I noted in the Sabrina X review (Vol15 no2), upgraded wound-film crossover capacitors are now used extensively in the Wilson loudspeaker line up, and not least in the Chronosonic XVX. As Daryl explained, there were several opportunities for improvement for these important components of the crossover network, urgently set in motion when Wilson Audio purchased the renowned Reliable Capacitors company (*reliablecapacitors.com*) to bring design and production of these vital components in-house at its factory in Provo, Utah.

With further investment in precision of manufacture, existing build lines were improved in accuracy and quality, while still better capacitor designs – as used in the XVX – could now be made. A rebuild and recalibration of the primary winding machine improved tolerances, while the metallic end terminations benefitted from a new process facility with still lower termination loss. A revised annealing program undertaken post winding improves tolerances while a reprogrammed sequence of high potential conditioning raises the dielectric stress limit, lowering losses still further.

The Chronosonic XVX's crossovers are built in encapsulated enclosures mounted externally, reducing the influence of internal vibration and magnetic fields, while custom Transparent cable is used throughout.

A direct link to the WAMM Chronosonic is the pair of near-18cm sliced-cone high-power drive units for the vital lower midrange, one located above and one below the 10cm upper mid and 25mm HF assembly. Here much experiment was undertaken to obtain a natural timbre by employing classic Alnico (ALuminum, NiCkel, CObalt) magnet formulations, while to achieve the linearity and sensitivity required an array of four magnets to energise this 'QuadraMag' driver.

We've noted in past reviews that magnet technology and magnet design can affect several aspects of sound quality, including transparency and timbre, while the upper mid driver and tweeter are also custom made by Scan, the latter – with its a refined fabric dome – now the fifth iteration of the top of the range Convergent Technology series.

### The Sound

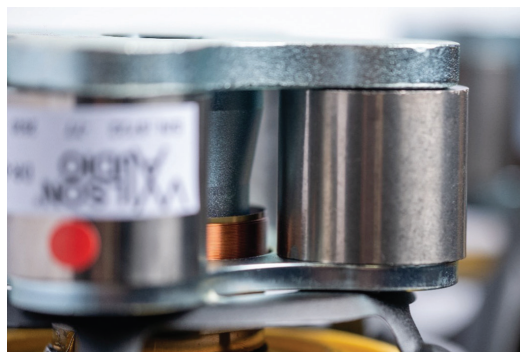
Regrettably my own listening room was not up to this heroic review project as it is served by a compact staircase and is also two floors up from street level. I opted to spend the days required to listen and measure at the Absolute Sounds private studio in Wimbledon. Here I was given a free run of reference grade music sources, electronics, cables, and in particular a full alignment for the Chronosonic XVX speakers, which were already



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The outputs from the crossover to the drive units



The Quadramag: a close-up of the powerful low distortion Alnico magnet array which powers the main mid unit, also showing the open form anti-reflection construction. Damped venting is employed for the lower and upper mid-range unit enclosures making them mildly aperiodic acoustically and electrically, also with a small increase in power handling.

well run in. My measuring system goes in four transit cases and is relatively transportable, and that came too – together with my 3TB music HDD, an original BBC LS3/5a and a few LPs, which were supplemented by Qobuz HD streaming of familiar music tracks.

As for that ambitious suggestion of a million-dollar system, if you total the cost of the review set-up, adding in our choice of Dan D'Agostino Momentum HD preamplifier and Momentum M400 monoblock power amplifiers (£125,000) or perhaps the darTZeel combo of NHB-18NS and NHB 108 II monoblocks for a similar budgets, you're already well on the way!

For my listening I also used the top-of-the-line dCS Vivaldi digital audio sources comprising, transport, DAC, Upsampler/Streamer and Clock, added in high performance Artesania Exoteryc racking for those units that benefit from it, and also included the Continuum Caliburn turntable plus active stand isolation, with Cobra carbon fibre tonearm fitted with the highly refined Koetsu Blue Lace Platinum cartridge.

Adding in the carefully tuned room surface absorption treatment, the matched low frequency standing wave mode traps, plus a Constellation Andromeda phono preamp and a reconditioned Studer A820 for 38cm/s mastertape playback would bring us closer to that seven-figure budget, as would the Transparent cable loom, including Reference XL AES digital interconnects, Reference XL digital clocking interconnects, Magnus Opus balanced interconnects and finally Magnus Opus speaker cables, with extensive support provided by Artesania Cable Elevators, at £798 each.

The Dan D'Agostino Momentum M400 monoblocks are specified to operate on loudspeaker loads down to 1ohm (but ideally averaging 2-4ohms), and they are certainly a good match technically with the Chronosonic XVX. They offer short-term maximum power of a massive 2,000W into the lowest rated impedances, which is, to quote the famous expression, 'more than adequate': while Wilson

Audio suggests an amplifier minimum of 100W/8ohm, I'd instead recommend '200W/8ohm with a full 4ohm rated amplifier capability'. The more the better...

### Tuned to the room

You never know what to expect from the combination of a different room, different placement, and accessories, and not least the local audio system. In particular, this room had been fine tuned to even out dominant coupled modes using a number of discrete frequency absorbers based on TubeTrap technology. In such smaller rooms these can provide the sensation of a much larger space promoting essentially uniform bass lines, and this was the case here.

It shows just what can be done when working with the XVX, while noting that the room compensation aspects will inevitably and unavoidably address some issues that may be inherent in the loudspeaker itself. My in-room response measurement (shown in the lab report) is unusually uniform and extended at low frequencies and this points both to the efficacy of the correction and not least the high potential of the loudspeaker when well matched to the room acoustic. It was quite extraordinary to find that, when driven by the Chronosonic XVX, this room measured uniformly down to a very low 15Hz -3dB, and was estimated at only -6dB down by 10Hz.

A variety of reference source material was on hand, plus extensive choices from my own files, and while the system was initially somewhat overwhelming both in scale and power, with such a huge dynamic range on tap there was great temptation to play louder than usual. A measure of self-discipline restored normality and I restarted at more modest sound levels, more sensibly to explore the system, loudspeaker and room.

Of striking and imposing appearance – the speakers are almost 1.9m tall when floor-spiked – the Chronosonic XVX's elevated, concave driver array arches towards the optimally seated listener: stand up and you readily hear that the



Wilson Acoustic Diode floor spike



*An alternative colour choice of several standard WilsonGloss finishes, with custom colours available to order*



acoustic arrival times from the drivers are now somewhat mixed, diluting the magic. However, what's also beyond doubt is that the stereo image is presented higher than usual, the listener placed in the stalls rather than the gallery, and with the performers on stage.

This was not unattractive, and in fact seemed more appropriate for concert venue performances of recorded music: there's a powerful sense of presence, going a long way towards presenting a compelling reading of the recording venue, taking the listener rather closer than usual to the performance itself. Dissecting these experiences in this way may dispel some of the magic of the whole, but needs must in order to scope the analytical section of this review.

First impressions were of a wide and enveloping soundstage, reaching to the room sides, and of full height. Eyes closed, the impression approximated to a very large cinema screen, but one where the individual sound sources were almost as focused and acoustically present as if they had been present in the corresponding visual images. The XVX ability to scale the image according to the musical event, the instruments, and sources was exemplary, and when eyes were closed the experience of many recordings now perceived as a whole event, was uncanny, at times downright spooky.

HD recordings were revealed as such, so great was the resolution, but in many instances this potentially higher performance format proved unnecessary during the evaluations. As many satisfying listening experiences were obtained with 'normal' material, LP, and CD, as with the best HD.

### Immediacy and presence

With 'Never Going Back Again' from Fleetwood Mac's *Rumours*, a standard mid-period pressing of a tape laid down in 1976 at LA's Sound City Studios, I nearly fell off my seat such was the immediacy and presence: it just could not be interrupted, and the track drove firmly to its conclusion. It sounded like you always imagined the master to sound, with a near perfectly reproduced vocal from Stevie Nicks – outstanding in character, expression, pitch and articulation – combined with excellent bass definition, and with huge levels of detail and excellent separation of instrumental lines.

And the stereo image was stunning: Stevie sounded solid, and of full height – well, all 5ft 1in of her! – while the spatial information in the track was decoded rather like a Stax Electrostatic, except that it was properly front stage. The spatial element was absolutely captivating, highly dynamic, and with fantastic rhythm, it led fellow listeners to opine, 'that's got to be HD or a mastertape and not a standard issue LP'. This evaluation was looking up.

Classical piano and orchestra came next, with my favourite pianist Martha Argerich, here with Christian Arming conducting the New Japan Philharmonic, in the Schumann piano concerto. With this spacious, natural yet well-focused recording, the soundstage was realistically huge, portraying the full orchestra almost in micro detail, so clear was the whole stereo stage. It was a shock to appreciate just how much could be heard – and how much there *was* to hear. The piano sounded powerfully dynamic and full bodied, well balanced in timbre, while the musical performance connected emotionally, another instance where you wished to hear it to the end.

By contrast it took a 1953 HMV recording, of Beethoven's Violin Concerto in D major with Menuhin, to reveal the analytical quality of this loudspeaker. Here the image was so narrow it proved the recording to be monophonic. But there was a mysterious effect where the violin remained separate, Menuhin's playing well-expressed, with the orchestra set in constrained layers behind the soloist. As I was to come to appreciate, the Chronosonic's near forensic ability has much to do with these recreated music performances: trying this track in mono via one loudspeaker only, this proved to be clearly the optimum way to listen to a single channel recording.

Talk Talk laid down the pop track 'Spirit of Eden' in 1988, and this complex, multilayered production remains highly involving emotionally – with this system it proved intimate and expressive, conveying the raw commitment of the vocals, while the production as a whole provided magnificent scale and power via the Wilsons.

Herbie Hancock's 1988 100th anniversary celebration of George and Ira Gershwin, *Gershwin's World*, can at times sound overproduced, inciting some over-egged bass confusion with some less-well-aligned systems. The first track, 'Overture (Fascinating Rhythm)'; here a CD rip to USB stick, was astounding on this system: the rhythm element in the bass was appropriately amazing, and all the complex percussion lines were perfectly enunciated in character, attack and speed. It was nothing less than a sonic firework display in '3D' stereo.

In contrast I switched to the Philip Glass's title track from the film *Koyaanisqatsi* – the original 1983 edition which I prefer to later versions, in another CD rip. With that heavy undertow of deep bass pipe organ and growling male voice choir, the XVX magnificently conveyed the majesty, weight and sheer power of this track, with an almost totally satisfying sense of envelopment, the whole event seemingly powered by a 5-litre turbo V8.

Meanwhile a familiar fast-paced song by the same composer, 'Liquid Days' from *Glassworks*

“The spatial element was outstanding: absolutely captivating, highly dynamic, and with fantastic rhythm, it led fellow listeners to opine, 'that's got to be HD or a mastertape and not a standard issue LP'”



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David Wilson with Tony Faulkner, whose award-winning Britten recording Martin used in his listening to the Chronosonic XVX

(1982), here sung by Janice Pendarvis, was simply amazing: the vocal was exemplary, not edgy, expressive when it can be flat, and delivered with bouncing, dancing, pitch perfect and tuneful bass lines, if just slightly slow on the beat. Pendarvis was rendered as standing, full throated and full blooded, a gripping and dynamic performance.

Eyes shut, the Chronosonic then took me to the Tokyo concert venue for Larry Carlton's 'That Road', so vivid was the recreation of the acoustic and the enveloping space of the location. Bassline tune playing was stunning, while the bass percussion was explosive, and body-slamming in its impact.

For jazz/crossover programme I sampled the track 'Saga' from *Ragas and Sagas*, an album by saxophonist Jan Garbarek, featuring Ustad Fateh Ali Khan and musicians from Pakistan, on the ECM label. The opening drum solo had fantastic definition and near-bone-cracking percussive power and speed, sounding very live with superb dynamics, and this was yet another piece which had to be played to its conclusion. You really felt that this small group of musicians was present in the room.

To date, I've not found Antonio Forcione and Sabine Sciubba's *Meet Me In London* set, on Naim 192kHz/24bit, to be very accessible musically, but on the Wilson-based system it fairly roared into life with attack and vibrancy, the effect of the virtuoso acoustic guitar playing and expressive vocals totally transformative and captivating.

Minded to experience how massive the percussion and bassline attack could sound, my finger inexorably (and appropriately) hovered over Massive Attack's *Blue Lines*. Pressing the play button, I was greeted with headphone-grade definition and immediacy combined with a full

soundstage, right there in the listening space, with immense low frequency power and envelopment. Without a doubt, this system can certainly rock.

With a very familiar test track of mine, namely Elanor McEvoy's 'The Rain Falls', the XVX brought out more of her Irish accent, while sounding nicely upbeat. The bass was tuneful and expressive, the whole delicately detailed and spacious: this was very good sound indeed. And with another much-played track, Harry Connick Jr's take on 'A Nightingale Sang in Berkeley Square', the sound was quite simply breath-taking. I really thought that I knew how this most familiar recording sounded, but I was readily disabused by the Chronosonic XVX rendering: performance was the keynote, Connick seemingly present in the room, sharply focused, life-size, near holographic, crooning intimately with perfect pitch, fine expression, great timing and articulation, supported by highly tuneful basslines. And as for the stand-back sax solo, well, I was blown away by its distant acoustic but with pinsharp focus, shocking naturalness and the spacious acoustic.

This was now getting silly, as the XVX began to weave its spell. My fellow listeners and I had to switch off for a while and try to regroup, with opinions such as 'never heard it this good before' as we were being shown wholly definitive stereo imaging, demonstrating excellent width, height and depth and remarkable focus.

We resumed with 'The Pilgrim', from the album of the same title by Abdullah Ibrahim: this track has an 'immediate', punchy sounding close miked piano, voiced for jazz, overall a dynamic and at times truly explosive sound imbued with great contrasts. Tune playing was excellent as was the quality of expression, while the piano sounded as if it was live, present in the room and of the right size.

### Playing up a storm

I returned to classical music with another favourite, the CD transfer of Tony Faulkner's award-winning recording of orchestral excerpts from *Peter Grimes*, with the BBC Symphony Orchestra conducted by Andrew Davis on Erato. From the 'Four Sea Interludes', the 'Storm' blew in with real menace building to that sudden squall, the orchestral bass drum delivered with full acoustic weight, shaking in the listening room. Perspectives were satisfying, orchestral colour very natural, with the acoustic of St Augustine's church, Kilburn lending weight and space to this fine performance.

Dire Straits' 'Telegraph Road' has a massive dynamic range, beyond the ability of many systems, but was a breeze for the XVX. Quite simply, this recording sounded thoroughly live, as if on stage, and demanded to be played through. Studio





crafting was also evident, but this is a familiar component in the production of this musical drama.

With many recordings of vocal groups, the Chronosonic XVX made it possible to imagine the precise placement of performers spaced right across the soundstage, each well-focused and also layered in depth. Intended out-of-phase production effects were dramatic, placed as intended well to the sides of the image, with some seemingly developed behind the listener.

All those subtle cues to image location were seemingly so well resolved that spatial effects were most impressive, and at times almost hyper-real, this particularly evident on Laurie Anderson's 'Slip Away' from *Life on a String*.

Those illuminated, intentionally slow-responding power meter needles on the Dan D'Agostino Monos could be swung far across their arced scales, in real terms peaking at 500W-plus, while the Chronosonic XVX speakers just lapped up the power to deliver sheer undistorted, undiluted musical impact, without any hardening of timbre or a perceptible shift in tonal balance.

An acid test for a neutral timbre or tonal balance is to play at increasingly lower volume settings: according to the loudness curves for the ear the sound should be increasingly bass-light, more distant and more 'open air' as sound levels are lowered – and that's just what happened with the Chronosonic XVX. I could so easily have stayed for a second week just to enjoy more music with this expressive and impressive system.

### Conclusion

In my original 1994 X-1 review I concluded 'The Wilson Audio X-1/Grand SLAMM sets entirely new standards for loudspeaker performance and sound quality, and I cannot be confident that I've yet found its measure. I feel sure that it won't age for many years to come but will continue to sound better with future improvements in ancillary equipment.'

Now, concluding the Chronosonic XVX review – and while realising this design is a more difficult electrical load, requiring careful choice of power amplification – I see the Chronosonic XVX as a worthy successor to that for its highly vivid recreation of musical events at a realistically large scale.

It comes close to convincing the ear, the heart and the mind of the listener, with all kinds of music, performances are taking place right here, right now, in the room. Yes, it can undoubtedly impress, but the Wilson Audio Chronosonic XVX goes a stage further than that apparently simple feat, and succeeds in capturing the imagination, to an extent you won't understand unless and until you hear it in full flight. Before this review I didn't believe this possible – I do now.

### HIFICRITIC Test results: Wilson Chronosonic XVX

#### Sensitivity

The manufacturer's specifications include a nominal sensitivity of 92dB/W at 1 metre, well above the industry-average 88dB/W – though, given the height of the array and proximity effects, this measurement will necessarily be approximate at the 1m standard measuring distance. It's likely that the effective far-field sensitivity is actually higher by about 1.5dB, as the acoustic outputs from the driver array will integrate to a higher level over the listener region, sounding more like 93.5dB per '8ohm' watt. However, I did confirm the manufacturer's specified 92dB/1m figure, for a nominal 2.83V/8ohm 1 'W' input.

At 1m our printed axial frequency response measurement will be rather off the mark for a tall array such as this due to the dissimilar path differences from the multiple drivers to the measuring microphone. Thus, a wider tolerance of +/-4dB was required to contain the nominal 'axial' frequency response. However, as we'll find, the summation of the multiple driver outputs is exceptionally good over the listener region of the room space, which is precisely what is required of such a tall loudspeaker system. If nothing else, it 'sounds like' a well-toleranced +/-2dB at the listening seat. (See also the 'room averaged response' measurement whose great uniformity confirms this view)

The high voltage sensitivity means that the larger valve/tube amplifiers may also be used, noting that this technology is tolerant of momentary over-current demands from the loudspeaker, here largely self-limiting and with rapid recovery from overload, so minimising audibility of these hopefully infrequent events.

#### Frequency Responses

Using the RAR 'room averaged response' criterion, front radiation weighted, and somewhat dependant on the manufacturer's 'test room', a very wide and uniform frequency response is claimed: some 20Hz - 30kHz, and with a tight +/- 2dB tolerance. Given the right room, the potential for researched placement and the multiple adjustments available on installation, this claim may not be very far from the truth except in the range above 15kHz, this generally beyond audibility.

The Wilson 'RAR' claim will not be representative of a typical room, whose absorption coefficient increases naturally with frequency, and in addition where finite-dimensioned 25mm high frequency units have an inherent 'power' fall with increasing frequency above 10kHz.

When I measured the third octave averaged response alternately for the two loudspeakers over the listening space, I obtained readings of +/-2dB

### The system

D'Agostino Momentum HD pre amp with Momentum M 400 monoblock power amplifiers, dCS Vivaldi Transport, with Vivaldi DAC, Vivaldi Upsampler/Streamer, Vivaldi Clock, Continuum Caliburn turntable with Cobra tonearm/Koetsu Blue Lace Platinum cartridge, Constellation Andromeda phono preamp, Studer A820 mastertape playback, Transparent Reference XL AES digital interconnects, Transparent Reference XL digital clocking interconnects, Transparent Magnus Opus balanced interconnects, Transparent Magnus Opus speaker cable, Artesania Audio Exoteric racks, Artesania Audio "AIR" amplifier supports, Artesania Audio cable lifters, Transparent power cables.

**Manufacturer's Specifications**

**Chronosonic XVX**

Drivers	One 10.5 inches (26.67 cm) One 12.5 inches (31.75 cm)
Mid-Range	Two 7 inches (17.78 cm) One 4 inches (10.16 cm)
Tweeters	Two 1 inch (2.54 cm) one front, one rear firing
Sensitivity	92db @ 1W @ 1 meter @ 1kHz
Nominal Impedance	4 ohms / minimum 1.6 ohms @ 326Hz
Minimum Amplifier Power	100 watts per channel
Frequency Response	20Hz - 30kHz +/- 2dB for Room Average Response
Dimensions	H: 73 5/8 inches (187 cm) w/o spikes, W: 16 1/2 inches (42 cm), D: 33 inches (84 cm)
System Weight per Channel	685 lbs (310.71 kg)
Total Shipping Weight	(approx.) 1,695 lbs (768.84 kg)
Price	from £348,000/pr, depending on finish

wilsonaudio.com  
absolutesounds.com

for 40 Hz to 5kHz, which result is quite excellent. Moreover the output remained within a closely-toleranced +/-3dB, from a very low 18Hz to 7kHz. From 60Hz to 1.5kHz the uniformity measured within just +/-1.5 dB, which is incredibly good for a room-coupled spatial average – however we must give some credit here at lower frequencies to the installed room mode traps.

The high frequency limit 'in-room' was fine at 21kHz, -10 dB – rather better than average – with the output partly damped by the absorptive side wall anti-reflection treatments in this particular measurement space. Giving the design the benefit of the argument in this modest 'test room', I obtained a frequency response of 18Hz to 21kHz +/-4dB overall, a very wide bandwidth for this spatial-averaged room-driven output.

My measurement of pair matching was problematic in this relatively confined space, but the very good +/-1.5dB limits I could impose were nonetheless very promising, making it clear these loudspeakers are both accurately built and very well installed. When auditioning a wideband pink noise signal in the room I found that the sound was noticeably even and well distributed, extending to the limits of audibility, and 'thundering' appropriately in the lowest frequency part of the spectrum.

Examining the output at 15 degrees in the vertical plane, both above and below axis, there is a little more loss on the upper, above-axis reading, as would be expected from this driver layout, but with no undesirable 'out of phase' trough in the crossover region. Clearly phase integration for the upper frequency drivers is surprisingly good given this complex construction. This fine behaviour was maintained for the 'panoply' of lateral off-axis responses, here measured iteratively out to 60 degrees, and these remained tightly tolerance, within +/-3dB from 100Hz to 20kHz, a very good result.

As instructed, I auditioned and measured with the grilles in place, these including some anti-reflection elements in the form of absorptive liners of selected felt. Grille removal did result in narrow frequency-region axisymmetric dips of up to 3.5dB in the upper range, but these were rather less evident a little off axis.

My best estimate of the low frequency extension is -6dB at 11Hz, which is very low and confers an unusually fine phase response at low frequencies, supportive of good musical timing, which we also confirmed during the listening sessions.

**Maximum Sound Output**

In a typical room of, say, 100m<sup>3</sup>, and with appropriate power amplification, highly realistic maximum sound levels of 114dBA should be possible from a stereo pair.

**Distortion**

There were many standout results but this one caught my eye: at a truly body-shaking 110dB/m at 24 Hz and with inaudible harmonic distortion, the test set showed a superb result of less than 1.5% distortion for both second and third harmonics, and no others of relevance.

This loudspeaker certainly draws substantial current at high powers, my modest 100W/ch lab test amplifier heating rapidly on these tests and needing a break at times. Dropping the power to a still audibly thundering 2.83 V (1W nominal) the 24Hz distortion figure was truly exceptional at just 0.2% for both second and third, and the rest of the harmonics were not worth recording: this was for a very pure sounding bass tone at a hefty 92dB SPL.

While the output was rolling off a little below 20Hz, it still sang well at 15Hz with less than 2% THD and, with only the 5th harmonic of note, at a still excellent 0.6%, of quite inaudible distortion (1W). Of the many readings taken up to 200Hz, these at 92dB SPL, the average distortion was 0.2% of 2nd and 0.15% of 3rd harmonic, though with a momentary narrow band reversal at 100Hz to 0.1% for 2nd and 1% for 3rd.

Averaging a low 0.17% distortion midband, typical readings were 0.16% 2nd and 0.035% 3rd at 700Hz the latter very good and likely thanks to the QuadraMag array. For 1kHz there was a trace of 5th at a miniscule 0.013%, this also illustrating the wide dynamic range of our test method. The tweeter has a little 2nd harmonic, 0.3%, 3kHz, at an admittedly 'loud' 92dB spl, but where 3rd harmonic was judged very good at 0.07%. At 5kHz it read a higher 0.65% for 2nd and a still lower 0.033% for 3rd, with no higher harmonics detected. Taken overall, the distortion results are indicative of fine linearity and dynamic range, and suggest that such distortion in normal use is essentially below the aural threshold, and thus inaudible.

**Impedance and Amplifier Loading**

With perfect honesty, Wilson makes no excuse for its speaker's very low electrical load impedance, seen to be 'lowest' at the low-mid frequency of 326Hz, where it dips to a minimum specified 1.6 ohms against a quoted '4ohm' nominal rating. According to best practice classical design the minimum value suggested for a 4ohm load is 3.2ohm, so in theory at least this design should be rated at '2ohm'. I recall the Apogee full range 'ribbon' loudspeaker decades ago with a 1-2 ohms loading, which was rather taxing even for the few then-available superpower amplifiers, including the massive Krell FPB600.

Furthermore, the significant reactive, 'phase angle' component of impedance over this Wilson's low frequency range makes the loading



## REVIEW

still tougher for the amplifier, and not least the interconnecting terminals, contacts, and cables. It is just as well that the Chronosonic sensitivity is comparatively high, where fewer specified watts than usual will be required for a given loudness. However, it must be said that choosing heavy duty loudspeaker cables and making sure of really well-maintained and -tightened binding posts will be vital if the full measure of the designer's intended dynamic range and inherent timbre is to be obtained consistently.

200-600W/channel-rated power amplifiers may be selected, with something like a 50A to 100A peak current rating for the higher power designs. And while, as we have generally noted, occasional momentary current overload in an amplifier may pass unremarked, but it would be sensible to choose a power amplifier with high peak current ratings to avoid premature power transistor/FET failure.

Before taking into account the reactive component seen in the complex Nyquist impedance measurement for loading, the DC resistive part is already pretty low at 2.8 ohms. With a sequence of similar low equivalent values over frequency, 2.7@21Hz, 1.9@70Hz, 1.2 @330Hz, 1.5@2.6kHz, my eyeball average for its 'rated loading' remains at a low 2.5ohms.

Both loudspeakers measured the same and I confirmed that no adjustments had been made to the 'bass damping' section of the crossover, e.g. for room matching at low frequencies and which might otherwise have affected these results.

At certain frequencies there are particular combinations of high equivalent current due to electrical phase and low resistance combinations which may tax some amplifiers still more: e.g. 28 degrees measured at 300Hz at 1.2 ohm, in practice a 1ohm equivalent, and similar low values at several other regions – namely 50 Hz, 220Hz, 450 Hz and 3.2kHz.

Even a powerful, 4 ohm tapped valve-tubed power amplifier will find this stressful and, while good subjective results are possible with these types, I consider they can't really be optimal. Even if momentary, such higher currents will likely age the output tubes more rapidly.

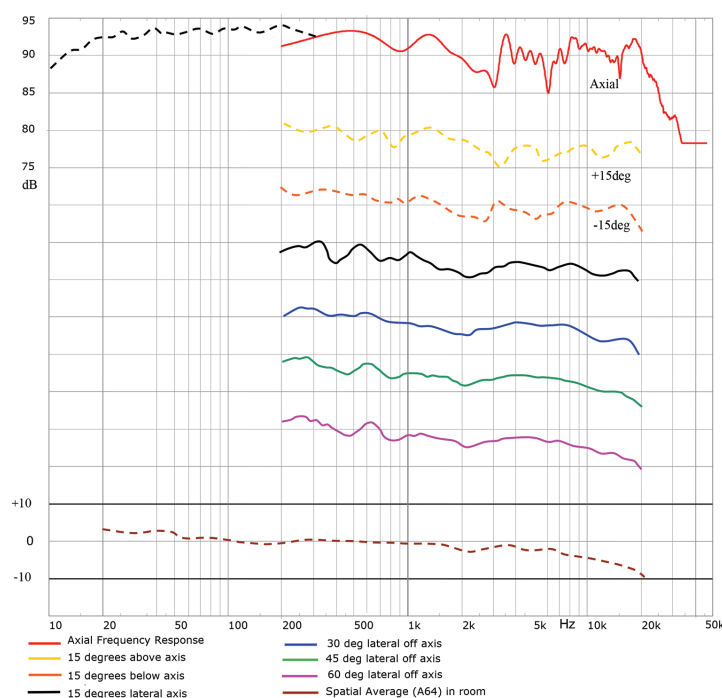
The Wilson Audio X1, the putative predecessor which I noted earlier, measured a higher 95dB/W sensitivity, and with a kinder average impedance of 6 Ohms. For a similar low frequency extension obtained from this smaller XVX, the maths and physics seem to have determined the lower sensitivity and heavier loading that we have now measured. There is clearly a rather greater current requirement to power up this much later, similarly extended bandwidth – but more compact – XVX design.

### Energy Decay

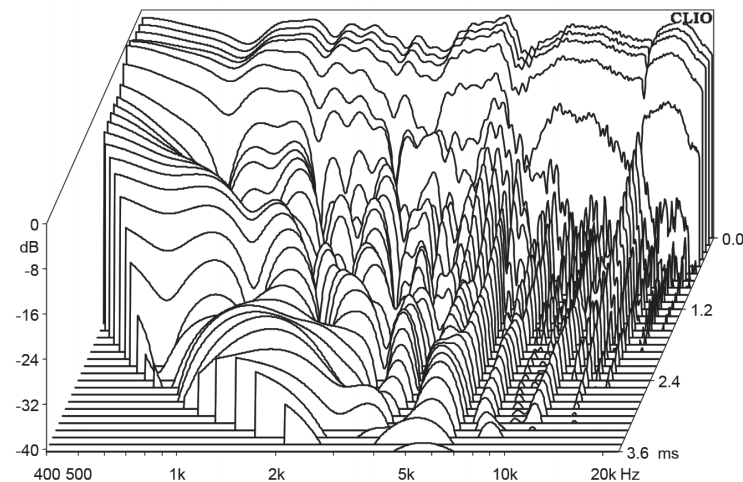
Proximity meant that our measurement of early decay was itself an approximation, but some observations can be made about the time decay result obtained. From the start data at the back of the trace we can see that the early decay is desirably rapid over the first millisecond and that the phase integration, e.g. for neutral musical transients, is very good over the 400Hz -20kHz range shown. The characteristic minor glitch in the HF output does lead to a narrow resonance near 16kHz, but I cannot say that I ever heard it. Overall, the HF section is nicely clear of decay energy, and while the upper mid unit also may show some activity in the 5kHz region, this too would be hard to pin down. Taken overall, low coloration and high transparency is indicated.

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Wilson Audio Chronosonic XVX Frequency Responses @ 92dB/W (8ohm watt)



Wilson Audio Chronosonic XVX Time Frequency Analysis CSD



# WATTs and SLAMMs

MARTIN REMEMBERS CLASSIC WILSON AUDIO DESIGNS AND ENCOUNTERS



David Wilson with his X1 loudspeaker in the Martin Colloms listening room

I first met David Wilson in connection with a compact desktop studio monitor he'd designed for his own use, dubbed the WATT – this standing for Wilson Audio Tiny Tot. Exhibiting his infectious enthusiasm and musical expertise, he first played it at the Chicago audio show in 1985, where I was stunned by its expressive dynamics, speed, crisp focus, and glass-like transparency, combined with what seemed immense image depth.

His skills in setting up a superb demo, even in trying hotel conditions, were also forcefully evident: in contrast to those of most other products shown there, the WATT's music transients were lightning-fast while the bass was lean and upbeat. I was well impressed, and set my sights on the loan of a pair for review.

The WATT is pyramidal in form, the apex neatly truncated for this compact design, while unusually the enclosure flanks were extended to form side wings, these reinforced externally by a massive crossbar of aluminium alloy, tuned and tensioned to a defined stress. Interior structural damping of the Corian (stone dust impregnated acrylic) panels was augmented by internal bolted-on lead masses, offering exceptional energy absorption in bending. This obsessive attention to constructional detail, and very low enclosure-generated colouration, was all in the cause of focus, outstanding depth, compelling dynamics and very high resolution.

This unusual loudspeaker was to become the foundation for a design philosophy leading to a highly respected and long-lived sequence of high-quality floorstanding loudspeakers from Wilson. The WATT-Puppy was initiated when the Watt was augmented by a combined floor stand/subwoofer base/bass unit dubbed the Puppy. I have assessed numerous development iterations of the W-P series over many years, and indeed purchased several versions for my own reference and enjoyment.

Something about this modular cabinet approach to system design led to many more Wilson W-P models, as well as those from several competitors, over a long and fruitful development career. This original format lives on as the Wilson Sasha DAW (HIFICRITIC VOL 14 April-June 2019).

A second Wilson milestone came a decade later in mid 1994, when David brought over to Europe his ambitious X-1 Grand SLAMM, introduced as a more compact, integrated enclosure realisation of the original WAMM. This X-1 design included both 38cm and 30cm bass drivers per loudspeaker, setting a

pattern for similar differentially sized arrangements in the Wilson range. My X-1 review was published 27 years ago in *Hi-Fi News*.

I noted that each assembled X-1 weighed a quarter of a ton, employing five moving-coil drivers with one or two ambience-enhancing, rear-firing piezo tweeters – not to mention that optional pair of humungous subwoofer towers.

This was followed by a second assessment, to include additional appraisals in a larger listening room and with alternative power amplifiers, for *Stereophile's* December 1994 issue. The X-1 revisit turned out to be unexpectedly instructive as the lowest 18 to 36Hz octave had not been fully expressed in my own extended open plan domestic room. In the magnificent Park Side studio of distributor Absolute Sounds the deep bass power and realism, and not least the tune playing of the X1 for the second appraisal, was now judged as simply outstanding – remembering that this was in the absence of those optional subwoofers!

## The room influence

This highly instructive experience illustrated the great influence the size, construction, furnishing and acoustics of a room have on sound quality: this optimal result wasn't obtained until a massive leather sofa and armchairs had been removed!

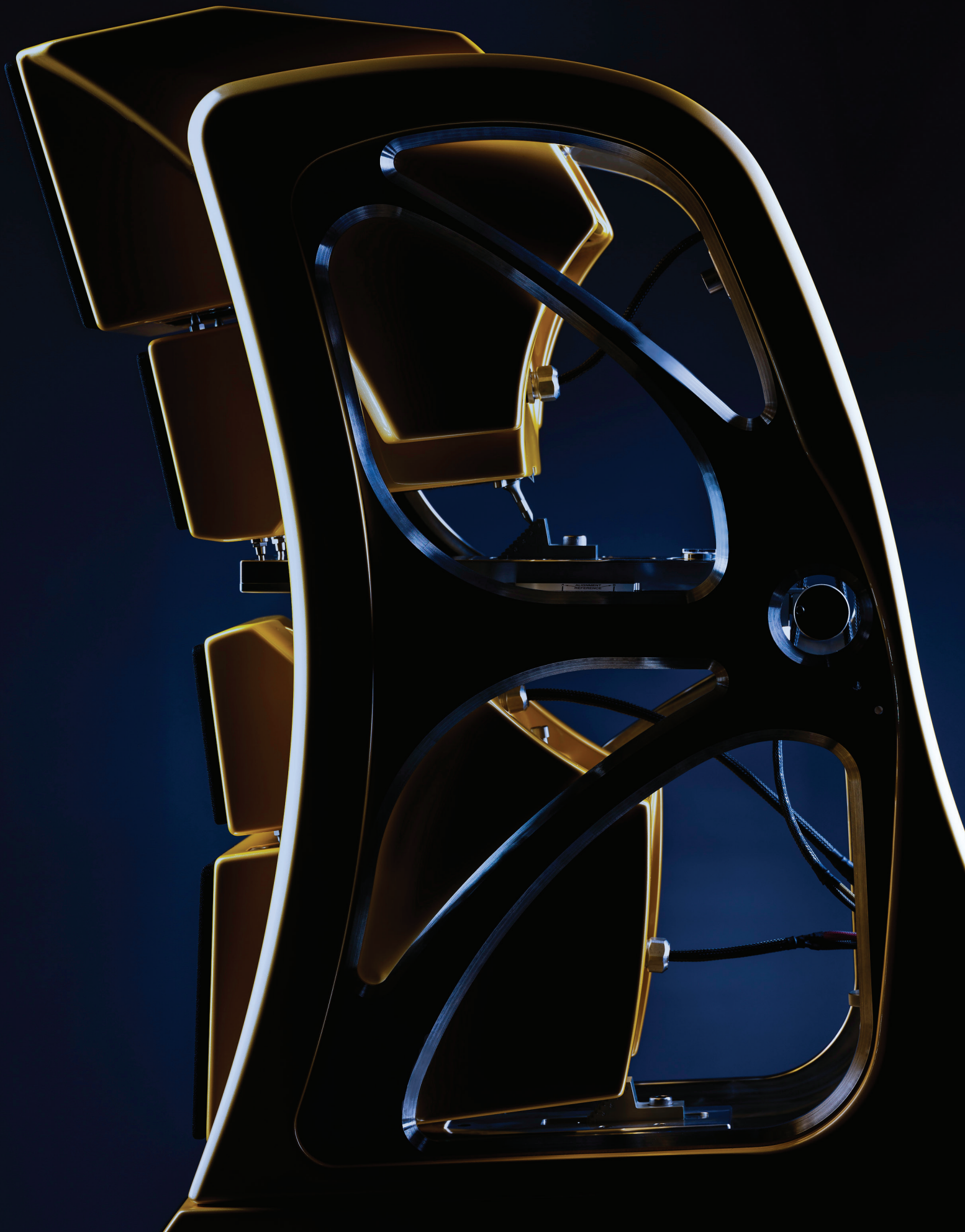
I'd taken several power amplifiers to this second stage evaluation to explore variations in power output and power supply size when driving such a demanding wide bandwidth loudspeaker. We were amazed at the discrimination which this loudspeaker exhibited as between nominally similar 100W/channel designs, with differences in bass extension definition and slam which were barely audible on my usual speakers were now rendered as chalk and cheese.

Quite simply, it seems that the X-1 was able to 'read' the size of the amplifier power supply. 2x10,000uF of reservoir capacitance had usually been sufficient for smaller speakers tailing off at 35Hz, but if you wanted to hear the nominal 17Hz -3dB limit of the X-1 to sing at power then 40,000uF reservoir capacitors would be a good start for the amplifier power supply, better still when fed from a matching 2KW rated power transformer. In this X-1 test it sounded as if the amplifier reservoir capacitors were in series with loudspeaker cable, which, topologically speaking, they were.









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