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I am sometimes accused of Luddism, less perhaps for preferring vinyl over CD than my scepticism about computer audio in general (he says, just as his server starts working again!). However, it seems that I'm by no means alone, as others too are finding that the computer is not necessarily the all-singing-and-dancing godsend that was originally assumed. I was chatting to a contributor who shared my suspicions and had stopped trying to use his NAS drive. And I recall another contributor, returning from holiday, had to restart his server some 20 times before it began working.

"But a CD player is essentially a computer" is sometimes heard (though in truth it's really only a dedicated microprocessor). However, because it's a fixed standalone unit it doesn't connect to the internet, and therefore doesn't keep downloading software updates, which seems to be the curse that plagues all computers these days.

Granted it's not very convenient to have hundreds of silver discs, all with those horrid jewel cases, just hanging around and getting in the way. It's so much handier to store everything on a NAS drive. That's certainly true, but for me the core problem appears to be to do with timescales. Some of my favourite albums are 50 years old, which is long before personal computers came on the scene. And a few of my favourite CDs even go back to the days of floppy discs, long before the internet allowed the people developing computer software to go off at half cock on the basis that it can always be fixed and downloaded later. On the music side it's difficult to decide who is responsible: customer demand spurs the music industry into creating new standards and formats, internet streaming services react, and hardware makers are required to keep up.

In the days when vinyl and CD were developed, it was important to get things right 'first time' as there was little or no chance of changing things later. (The evidence is seen in numerous failures that also occurred!) Attitudes seem to have changed today. I've recently endured two spells of 'no internet', each lasting a week. While it was interesting to realise just how internet-dependent we've become, one of the Openreach guys who came and fixed the system told me that the 'fault' had been due to a software change that had stripped off my ID. He added that it was quite normal to start using software when it was just 80% finished, as it could always be updated after any bugs had revealed themselves.

Those internet incidents might not be strictly relevant to computer audio, but they do represent a similar attitude. I shall therefore carry on using my server as long as it continues working because it's so incredibly convenient, but I won't lose any sleep if it stops working again. And I'll keep my CD player well warmed up just in case…..

Paul Messenger
Editor

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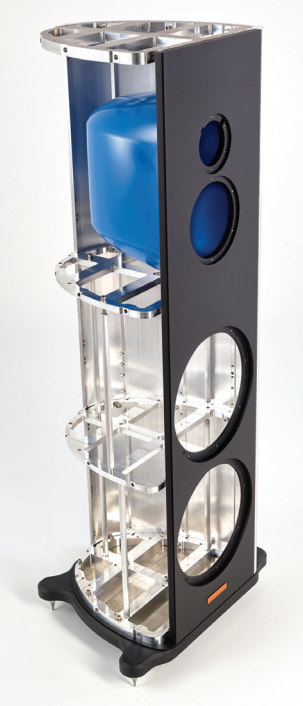

Magico has released a MkII version of the S5. Martin Colloms reports on page 38

Magical Magico S5 Re-invented

FIVE YEARS ON, MAGICO HAS RELEASED A MkII VERSION OF THE S5. MARTIN COLLOMS REPORTS

Some Magico loudspeaker systems have not been to everyone's taste, partly because most of the models intentionally have very little sonic flavour. They can sound colourless, even dull, and lacking in overt dynamic expression. This can make them awkward to install in a system, and they will ruthlessly show up any unwanted 'character' in other audio components.

Conversely, many more tonally colourful loudspeakers may greatly benefit from careful timbre balancing, for both the room and the matching ancillaries, to achieve a reasonably neutral and musically well balanced result. However, having achieved an optimised combination it can subsequently prove awkward to substitute other components, as all such substitutions need to be in character and musically consonant with that particular system voicing.

Looking back at my experiences with Magico in previous years I feel that my initial experiences at UK shows may have been somewhat blunted by the frequent use of Devialet electronics, as the presentations had relatively little impact on me. My first formal review encounter, with the classic *Q1* compact stand-mount, was also flawed, due to a partial failure on my part to recognise just how neutral it was (*HIFICRITIC Vol6 No3*). With hindsight, this highly transparent reproducer had ruthlessly exposed the varied timbres and character traits of the components in my reference system, but I had tended to blame the loudspeaker for some of what I heard. The review was by no means negative, but I knew later that I had missed some of the particular aspects of sound quality which had been successfully addressed by the designers. And I also felt that driving my 25 by 35 foot open plan lounge was a step too far for these small speakers, particularly when following the then resident floorstanding Wilson Audio *Sophias*.

I was game for a bigger Magico better suited to my room, even though the larger *S5* had already been around for some two years. With the *S5* that contentious system matching aspect reappeared, and once again the integrity of our reference audio system came under scrutiny. The great transparency and low colouration inherent in the *S5* was uncovering previously unidentified and highly subtle characteristics in every audio component, including cables, anti-vibration supports and equipment frames. The reference audio system was fully broken down and painstakingly rebuilt, these travails finally leading to a markedly better understanding of the S5, and ultimately led to a highly positive review outcome (*HIFICRITIC Vol7 No4*). Some months later I tried the *S3* (*Vol8 No3*), a downsized *S5* (which I hoped might become a reference), but its alloy outrigger support bars exhibited some resonant behaviour on my floor, adding undue mid-bass richness. (I note that since my review the S3 has been found to perform well on more conventional floor constructions so it could be worth another look.)

In any case the *S5* review was more than sufficiently positive to acquire a pair, though by the time these arrived another 6 months had passed, subsequently followed by extended running in (an intrinsic aspect of the marque). I consider that Magico's *S5* has qualities well beyond its price, including huge power handling (over 500W peak programme), accurate neutrality, exceptional timing, plus great focus and clarity, a combination that is particularly useful for an audio critic. Running in brought still greater clarity, integration and dynamic resolution, allowing me to take the Naim *Statement* amplifier close to its sound quality and power limit. Auditioning this truly great combination was also shared with many colleagues.

In December 2015, Magico announced the *S5 MkII*. This did involve a substantial price rise (£42,000/pair compared to the £30,000 of the original), but based on past experience I nevertheless requested a pair, anticipating delivery in early Feb 2016. (They finally arrived in May!)

Once again the long process of running in began, and although publication might have been possible

MARTIN COLLOMS

in the June issue, we deliberately held them back until after some more months of heavy use had moved them to a higher and more stable quality level. The *MkI* experience had shown that small gains in subtlety were discernible up to nine months after first use, due to the technologies employed, such as the exotic Mundorf capacitors in the crossover networks.

Comparing our well run-in *MkI* with the factory fresh *S5 MkII* over a single day, the latter immediately sounded more punchy, extended and dynamic in the bass, with still firmer control, plus enhanced fluidity and delicacy through the mid and treble. The midrange was considered a little cooler, if more precise, more detailed and transparent at this early stage, while the treble was perceptibly more open, clearly providing improved detail and transparency.

It was also obvious that the new enclosure design provides considerably better stability than the *MkI*, thanks to oversize solid alloy base plates some 4.5cm thick. These plates provide a much larger physical footprint than before, with four large 5cm (2in) diameter stainless steel pads, so the floor coupling arrangement is substantially improved. The pads are fitted with 12mm diameter, locking, stainless steel spikes. The spikes mount in turn to large stainless steel inserts forged into the alloy base plate. Besides increasing the physical presence of the loudspeakers in the room, the new footprint is some 40% larger, resulting in substantially improved stability.

The new model represents a 40% increase in price over the original, but you can see right away where some of the extra money has been spent, both in this sculpted alloy base with its black satin textured finish, and in the contoured alloy top panel that's machined from the solid. Its distinctive curves will help disperse any minor reflections resulting from some loudspeaker output interacting with the ceiling, which might otherwise cause a mild standing wave. And like the *MkI*, the convex side panels will have a similarly dispersive effect on the reflections excited by the loudspeakers onto each other and from the room front and sidewalls.

Magico founder Alon Wolf explained that by the time they had finished the aluminium alloy *S5 MkII*, apart from some bolts and connectors, the only parts in common with the original were those half-inch thick curved alloy side panels.

Although the design team, led by Chief Engineer Yair Tamman, had particular objectives for the *S5 MkII* improvement programme, developments resulting from research on models higher up the range also became available. The *S5 MkII* and the *S7* therefore have much in common, and the extra 10in bass driver fitted to the *S7* is only really needed for very large rooms.

The *S5 MkII* driver array looks very similar to the *MkI*. Splitting hairs, the beryllium tweeter dome looks a little darker owing to a charcoal grey, 5um diamond-graphite reinforcing deposition. Most other improvements are hidden. A new 165mm pistonic midrange now has a fractal, anti-resonance rear enclosure, and the pair of new 250mm (10in) diameter (equivalent to a 14in unit) long throw bass units are sealed-box loaded. The mid has

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improvements to the motor, and super tough graphene is used to reinforce the diaphragms of all three cone drivers. The alloy enclosure comes in two alternative finishes with a wide range of colours: M-Cast is a textured powder-coat; M-Coat is a high-gloss lacquer (at an extra £5,500).

Magico specifies a sensitivity of 88dB; a 4ohm amplifier loading; a suggested amplifier power from 50W to 1,000W; and a nominal frequency response from 22Hz to 50kHz (but with no limits stated). Each weighs 100kg (220lb) and is 122cm high by 38cm wide by 36cm deep. Single wire connection is via heavy duty Mundorf copper binding posts for spades and 4mm connections.

Sound Quality

The sonic picture began to change after a few days of heavy use; the subtle first impression of a mild lack of coordination began to fade, and new confidence in the more dynamic sound delivery took hold. It was already sounding more powerful, crisper, more focused, more open than the *Mk1*. The *S5* is well known for its very low self noise levels, deep stereo images and deeper silences, but perhaps surprisingly the *MkII* already sounded an order of magnitude improved in these key areas. Dynamics were quite excellent, and image focus had begun to stabilise. As the weeks elapsed this more open and articulate timbre suggested changing to a toe-in alignment rather than the near straight ahead formation (axes crossing about 0.5m behind the listener) which best suited the *MkI*. Now some of that inner potential was becoming apparent in the shape of greater coherence for far depth imaging though with a narrower overall image width, noting that at this stage for the install process the central images were not quite as pin point as I have experienced.

A clue to sound quality can often be found when listening in the corridor to the largely integrated room driven sound, which was surprisingly lifelike. We also found that the *S5 MkII* could play almost impossibly loud with near perfect clarity and no perceptible hardening, textural crowding or dynamic compression. The most difficult and densely scored material was handled with sweet clarity and with particularly low fatigue, a strong indicator of inherently low distortion together with exceptionally uniform frequency responses.

Bass percussion is noticeably more tactile than the *MkI*, more expressive, dynamic and tuneful, sounding faster with better controlled percussive impact, and more apparent power from 30 – 50Hz. Percussive slam is rendered without boom, and low frequencies clearly show improved transparency. These observations were clearly heard when using a CH Precision *A1* power amplifier.

Even before running in the mid and treble regions had exceptional clarity, depth and micro detail, and these are now extended to the bass, adding abundant image depth and transparency with a heroic sense of scale. It goes beyond opening a window onto the performances, now sounding as if the whole wall had been taken down and the auditorium extended out into the street. The deep field imaging is close to stunning and is imbued with power, detail and dynamic expression, patently not just the usual vaguely spacious wafting so often encountered with lesser systems.

The *MkII* remains clear, stable and sweet at very high sound levels that had previously verged on annoying with a number of high end loudspeaker systems. My system could now be played several notches louder without fatigue, a hallmark of true quality founded on very low distortion and minimal resonant colorations.

Musical expression was impressive from the off, the sound drawing one in with consistently high and steadily improving levels of fine detail. Highly expressive kettle drum dynamics rewrote the performance standard for this price category, and drum transients and pitch were perfectly clear. Complex bass percussion was well separated and delineated, and each bass instrument demonstrated colour and character.

Those substantial spikes provide significant scope to alter the azimuth, fine tuning the mid-treble timbre to taste, and aligning the *S5 MkII* for the particular ear height. As the system settled, a rather larger soundstage became possible, so I reverted to the classic Magico alignment, with the loudspeaker axes crossing 0.3 – 0.6m behind the listener. The *S5 MkII* expands all the image dimensions, and also focuses out of stage localisation more clearly. It revealed subtle changes in location, acoustics, vocal mics, the type and quality of reverb used, and not least the character of each venue, particularly classical concert halls.

The *S5 MkII* will ruthlessly and cruelly expose a poor choice of system components, but once brought into balance it becomes highly sympathetic to the music. Many albums I had long abandoned have now become satisfying.

Some classic tracks help to illuminate this. The *S5 MkII* revealed wonderful insights into Michael Hedges performances and playing on *Aerial Boundaries* highlighting the amazing forward drive generated by his innate rhythm and timing.

The massive soundstage production of complex material such as Pat Metheny's *Cathedral In a Suitcase* (from *Secret Story*) was fully revealed, matched by

a forward driving momentum leading to a web of complex interlinked musical lines composed of varied and well differentiated percussion. Layers of low level detail are beautifully revealed while the recovery of spatial effects is significantly superior to the *MkI*, and recorded spaces are clearly illuminated and sharply focused. This illumination is achieved without false edge or hardness, and if anything the tonality is sweet and flowing compared with much of the competition. As it ran in, the already very good upper range showed increased subtlety and detail, with delicate traceries of transparent treble.

This Magico sound does not jump out of the box; rather it follows the now clearly heard perspectives inherent in the wide variety of recordings tried. Performers sound more natural, more familiar, more like themselves, their inner character is more clearly revealed, while the ambient imaging can be spookily spacious, seemingly more like a full surround system than just two loudspeakers.

Steve Reich's mallet instrument works can be a trial, often with excess hardness and emphasised percussive ringing, blocking detail and adding fatigue. But not with these Magicos, which fluidly brought out the full timbres and rhythmic complexity with excellent timing and no trace of hardening.

Tough cuts such as Rickie Lee Jones' *A Lucky Guy* (from *Pirates*) was the best replay of this track yet experienced. On Jan Garbarek's *In Praise of Dreams*, his saxophone was rendered fluid and expressive but without the often experienced 'shriek' and false hardness. Or consider Alabama 3's opening track (from *Exile on Coldharbour Lane*) which is quite dense, with subtle low level detail and timing, easily masked. The *S5 MkII* reached deeply into this soundscape offering perspective and content not previously heard, allied to a firm, rocking, undertow beat.

With appropriate material it offered nearly effortless image depth, with very good focus, while the additional use of a 500W/ch Constellation amplifier showed just how well it handled high powers. The *S5 MkII* may be said to punch well beyond its weight. The clarity, resolution, forward drive and effortless timing somehow appears to re-master one's whole music inventory, extracting more excitement, more detail, more performers, more spatiality, with great power and definition at the frequency extremes.

Conclusions

While the excellent sound quality is the key to these conclusions, it has also been fascinating to track the technical differences which explain how the outwardly very similar *MkI* and *MkII* versions of the Magico *S5* sound the way they do. While the *MkI* is a leader for low distortion and won many awards for sound quality, the *MkII* goes an extra mile with substantially less – indeed state of the art – self generated noise and distortion. Furthermore, transient decays are faster, for cleaner dynamics and greater transparency, and the acoustic outputs of the drivers are better blended, integrating more uniformly over the listener space.

For the science-based reviewer, it is great to see theory so accurately translated into the listening experience. While the *S5 MkII* may not immediately impress with whizz-bang auditioning, it has power and majesty, excellent resolution, natural timbres, deep, dynamic, authoritative and very well timed bass, combined with huge well focused stereo images. Easy on the ears, you can listen for hours on end to this rhythmically involving and highly musical design.

Lab Results

Frequency Responses

It was interesting to compare the response curves for the *MkI* with those for the *MkII*. As before, tight ±2dB limits contain the axial response, though the *MkII* shows a small +1.8dB prominence at about 6kHz on the upper mid-to-treble axis. Despite equalisation, the *MkI* had a +7dB treble peak at 34kHz, while the new and better damped tweeter peaks at just +3.5dB (at the same frequency, and without equalisation). The original's equalisation meant that its impedance fell to 1.4ohms at higher frequencies, while the new version avoids this difficulty with a more comfortable 4ohms for frequencies beyond 20kHz.

In the bass, the *MkI*'s -6dB is at 28Hz, while the *MkII* goes down to 24Hz – giving a surprisingly audible improvement. The acoustic output in the vertical plane of the *MkI* was essentially symmetrical above and below the main axis. For the revised *MkII* voicing, the above axis output now decays a little, dipping by 6dB at 3.4kHz in the crossover region.

Responses for the vertical angles from the listener region and below are now held close to the primary response. The lateral off-axis responses (at 7.5, 15, and 30 degrees) now mirror the axial result within 1.5dB all the way to 10kHz, while output remains a pretty accurate ±2dB 30Hz – 10kHz even at 60 degrees off-axis, so lateral room reflections should still sound very natural. And the usual crossover region dip, which here is just beginning to show in the extreme 60 degrees off-axis trace, dips barely -2dB. Clearly the driver outputs are particularly well blended.

The Review System

Constellation *Virgo II*, *Inspiration 1.0*, Townshend *Allegri*, CH Precision *C1* control units; CH Precision *A1* stereo, Constellation *Centaur* monoblock, Naim *NAP500DR, NAP300DR* power amplifiers; Naim *SuperLine* phono pre-amp with Linn *LP12* player with *Keel* chassis and *Radikal* motor control, Naim *Aro* arm, Lyra *Delos* cartridge vinyl replay; Naim *UnitiServe* network server and S/PDIF source, NAIM *NDS Streamer-DAC* [*555 PS(DR)*] server/streamer; Wilson Audio *Sabrina*, Magico *S5,* Focal *Sopra-2*, Quad *ESL63*, BBC *LS3/5a* speakers; Naim *FRAIM* racks; Transparent *MM2*, Naim *NACA5* speaker cables, Naim *Super Lumina,* Transparent *MM2* and Van Den Hul *Carbon TFU* interconnects.

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"The build practice resembles aircraft engineering, and is somewhat different from simply bolting drivers into relatively elastic wood-based constructions"

In-Room Averaged Responses
The in-room averaged response trace again shows subtle improvements over the *MkI*, with greater uniformity from 20Hz to 20kHz, plus improved deep bass extension that is still powerful down at 20Hz. Even with room averaging, output measured 55Hz – 18kHz ±2.5dB, plus bass extension to 22Hz, -6dB, which is an exceptional result.

Sensitivity and Pair Matching
There was no significant change in sensitivity, the figures remaining at a slightly above average 88dB per 8ohm Watt. This is combined with a fairly good 4-6ohm impedance, indicating the possibility of high power drive from a fairly load tolerant amplifier of up to 1kW peak program capacity. A pair of these speakers will be capable of delivering a seriously loud 113dB maximum when operating in a medium sized (eg 80m^3) listening room.

Closely toleranced pair matching is known to sharpen image focus, and here the *S5 MkII* delivered state-of-the-art ±0.75dB L/R agreement from 50Hz to 36kHz (despite some local measurement difficulties from the room environment).

Load Impedance
While the impedance may be seen dipping to a fairly low 3ohms resistive at 70Hz, the more awkward moment is at around 45Hz where a 4ohm magnitude is combined with a moderately high 50 degrees phase angle, suggesting a momentary worst case amplifier load value of about 2.2ohms in the bass. The nominal loading is 5ohms from 35Hz to 45kHz, along with moderate ±30 degree phase angles. Valve amplifiers will drive this load from a 4ohm matching tap, and good solid state designs should have no trouble at all. Measured before fully run in, the system low frequency resonance was a desirably low 29Hz (and will likely settle to 27Hz).

The Grilles
The well made and elegant magnetically retained, perforated steel protection grilles do slightly affect the output, audibly and measurably, the latter if only by narrow band ±2dB ripples seen on high resolution analysis. However, I only install them for children and non-enthusiast visitors. The grilles are so easily fitted and detached that there seems no good reason not to detach them when listening critically, as the sound is sweeter, faster and better focused. Aesthetically they also look fine, if a bit technical, with the grilles removed.

Decay Results
The 'waterfall' decay results indicate a desirable near-linear-phase initial amplitude response, with the very rapid decay clearing associated with a fast transient quality and high transparency. High frequencies are particularly good, decaying rapidly by 40dB all the way to 25kHz within a millisecond. The transient response of the new composite midrange driver is not far behind, and again is notably improved over the *MkI*. (The decay analysis cannot include low frequencies for which true free field conditions are required, but the extended bass sealed box alignment found here is known to deliver superior decay behaviour with commendably low group delay.)

Distortion
Noting that harmonic distortion is always greater in the bass than the mid and treble, a high 10W sinewave input at 100Hz (generating a serious 98dBspl) gave excellent results with the *S5 MkII*. Second harmonic was an essentially inaudible 0.3% (the ear has more inherent distortion than this). The subjectively important third harmonic was an excellent -64dB (about 0.065% and frankly inaudible). The fourth harmonic was vanishingly low, and the fifth read a tiny -72dB (about 0.025%).

It could accept more than 22Vrms at a very low 20Hz before mechanical overload. Audible doubling at 20Hz did not occur until an input of 50W of sinewave, at which point the whole house was vibrating in sympathy. By 30Hz it was comfortable

with 29Vrms (200W/4ohms) short term, and here second harmonic remained a very tolerable 1.5%, while third harmonic was also exceptional at just 3%. At 50Hz it would accept 70W continuous sinewave without complaint, literally thundering away.

At 98dBspl, 100Hz results were again exceptional: 0.25% second, 0.07% third, and just 0.03% of fifth harmonic. This is truly state-of-the-art bass reproduction. At 500Hz, 10W, the figures were very similar: 0.13% for second harmonic, while third (in the region where this harmonic is expressed as the vowel 'ow'), it was amazing at just 0.08%. For a fairly loud 1W, 88dBspl above 200Hz, it gave only 0.03% second and 0.1% third harmonic, with no further contributions higher than 0.02%. These are figures that might be expected from good electronics, not a piece of machinery.

At a decently loud 88dBspl, the bass distortion was typically better than 0.1% from 60 to 150Hz – as yet unheard of results. Moving up into the more aurally sensitive midband showed progressive improvements.

Precise measurement over the vital midrange band 500Hz – 2.5kHz (where the residual resonant behaviour of the new fractal-type midrange enclosures will be active) showed that the third harmonic distortion improved steadily with frequency above 800Hz. The new design averaged a 6dB advantage over an octave of the midrange; every little helps!

Just for the record, at 88dB and frequencies above 75Hz, the overall distortion never exceeded 0.1%. For 80% of the span below 20kHz it measured just 0.04% second and 0.03 % of third harmonic. These are amazingly linear results: put simply, it produces still less noise when operating, aiding transparency and promoting natural timbres.

Design And Technology

Many design and manufacturing improvements found in the *MkII* are relevant to observed sound quality advantages. The build practice resembles aircraft engineering, and is somewhat different from simply bolting drivers into relatively elastic wood-based constructions. When the *S5* drivers are bolted in with torque-calibrated tools, the resulting registration of the driver to enclosure remains closely coupled and stable, essentially for its operating life.

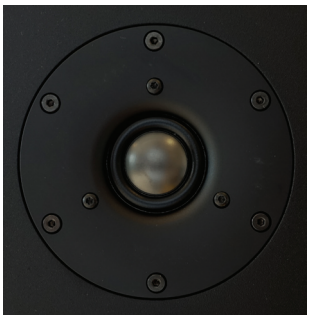
While the bass from the *S5* remains of truly substantial power and quality, four years of subsequent development with computer modelling has led to significant gains in magnet and motor design. These have now 'trickled down' to the *S5* from the *S7* series flagship, but there still has to be some further explanation for the *S5 MkII*'s important improvements in bass articulation, slam, definition and power.

One clue lies in revised build specifications, where the linear throw or excursion of the bass drivers has been increased, along with advanced electromagnetic modelling of the complex behaviour of magnetic flux in the gap. The intrinsic magnet and coil construction has been extensively revised to reduce higher order distortion products. Variations in the force factor Bl (equivalent to engine torque) with excursion have been reduced, and the excursion limit for a given Bl decrease has almost doubled.

Of particular interest to me (as I feel it's crucial to clarity), the variation of driver coil inductance for a given maximum displacement is important, and has now been improved by 2.5 times. In addition the linear excursion range for the suspension returning force has been doubled. Chief engineer Yair Tamman is attempting to create low frequency drive here that sounds similarly transparent to the midrange, a quality that has so far eluded all but full range electrostatics.

Put an ear to the new bass driver at low volume and notice substantially better clarity, and an absence of the usual mechanical clanking and ringing sounds commonly encountered. (In practice, these sounds are often masked by the midrange section.) Although masked, there remains some loss of detail, depth and transparency from a kind of gray aural fog, which also compromises natural dynamic expression.

The new bass drivers have very rigid alloy cones plus enhanced pistonic rigidity thanks to the enlarged central dome section. The pistonic cap structure is further reinforced by tough graphene



platelets enhancing the existing carbon nanotube matrix. The bass driver pair is rated for a massive 115dBspl at 50Hz. They drive the ultra rigid 12mm thick alloy sealed-box enclosure, with high damping and a near linear phase output.

The *S5*'s midrange driver now has a moulded polycarbonate back box to create an essentially non-reflective sealed volume. Its basic purpose is to block back pressure from the bass section, including residual lower frequency internal standing waves. It has an unusual spatial geometry with fractal equations determining a complex irregular shape. All the internal acoustic paths from the back of the mid cone to the box walls have different values, avoiding standing waves and leaving a single fundamental frequency. The traditional alternative is a plain rectangular box filled with fibrous absorbent. However, the stuffing can inhibit subjective speed and timing accuracy, yet still fail to suppress all trace of the internal modes. The overall midrange noise floor is typically improved by 8dB over a standard box.

Still more technology has been applied to the new midrange driver, including graphene reinforcement of the existing carbon-nano-fibre-skinned, Rohacell cored, composite cone (first developed for the exclusive M Pro model). The graphene, applied in quite small proportions as platelets, does offer an intrinsic 20% mass reduction with a 3x increase in stiffness for the cone, helping shift the first breakup frequency upwards some 500Hz and avoiding the need for the upper resonance compensation previously employed.

Third harmonic distortion is further reduced here, significantly reducing the higher order intermodulation products. Magico uses an underhung 75mm voice coil with a titanium former; inductance is controlled by a massive copper pole cap. Together these improve many of the complex intermodulation distortion products generated in the midrange by up to 10dB. These tend to mask transparency and add perceptible grain and timbre shifts to the sound quality. And the neodymium-based motor uses two oversize magnets to provide a stable and linear magnetic field.

The new *MB7* diamond/beryllium composite treble driver now has smooth extension beyond 35kHz. The peak in the previous monolithic beryllium version was compensated by an electrical network that subtly smoothed the sound character, but at some small cost in dynamics and clarity, and with more severe amplifier loading.

The revisions have allowed a 5% reduction in voice coil length, reducing mass and inductance for the high frequency unit. Distortion has also been reduced, as a new neodymium motor has been designed for increased linear coil excursion. While it cannot be seen directly from the frequency response, the slightly larger, diamond reinforced dome no longer requires equalisation. Thanks to computer simulations and laser scans the assembly is also seen to be more pistonic at very high frequencies.

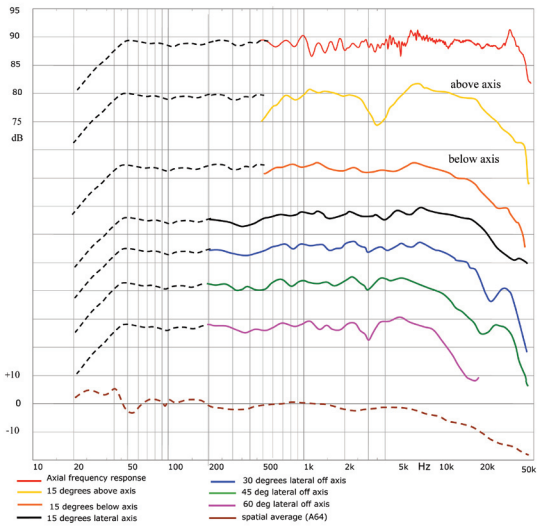
New internal wiring from Japan is a multi-diameter formulation to reduce any frequency emphasis. Furthermore, to avoid terminations and solder joins, electrical connections are unbroken from the input terminals to the drivers, save for the series connection of some crossover components. The circuit is star-wired to avoid possible coupling and cross modulation. Closely toleranced Mundorf crossover components maintain accuracy and provide close pair matching. (The reference grade oil-impregnated film and foil capacitors are wound slowly and tightly for lay accuracy and to avoid air layers; the resulting tensions and stray polarisations take time and use to dissipate, and are a factor in the running in process.) Mundorf builds these customised crossovers for Magico. The complete loudspeaker system is fully modelled to a symmetrical elliptical filter alignment for good phase response in and out of band.

The inductors are also Mundorf's top grade copper foil and polypropylene film designs, with very low resistance and a high saturation ability, thanks to grain-oriented, insulated, eddy-current-free laminar alloy cores. For some key positions, especially the high frequency section, Mundorf MCap Supreme EVO Silver/Gold in Oil capacitors. (Phew! – *Ed*) are used. However, the improvements in midrange and treble drivers have also allowed a small simplification of the previous crossover.

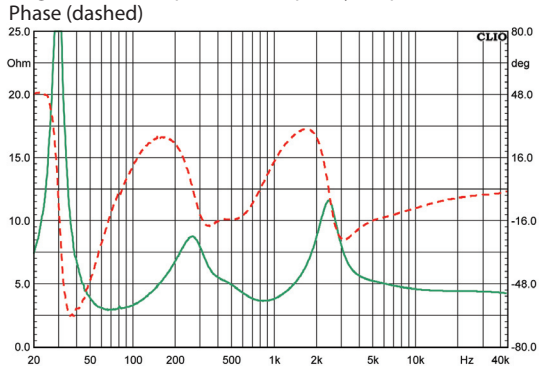
Test Results

HIFICRITIC Measured test results August/Sept 2016	
Make	Magico
Country	made in USA
Model, style	S5 MkII, moving-coil, floorstanding, sealed-box, aluminium enclosure,
Price per pair	M-Cast £44,000, M-Coat £49,500
Colours	various
Size (HxWxD)	122x38x36cm
Weight	100kg (220lb)
Type (infinite baffle)	3-way: 2x25.4cm alloy bass, 15.2cm midrange, 25.4mm beryllium dome tweeter
Sensitivity	88dB/W measured (2.83V) (88dB claimed)
Amplifier loading	4ohms typical (3ohm min): 'fairly tough loading'
Frequency response, axial	36Hz to 21kHz ±2.0dB (listener axis) 'excellent tolerance'
Frequency response off- axis	excellent: see graphs and in-room response
Bass extension	24 Hz @-6dB, (22Hz @-6dB in-room)
Max loudness, in-room	111 dBA for stereo pair
Power rating (max, min)	800W, 50W
Placement	Free space, spike coupled

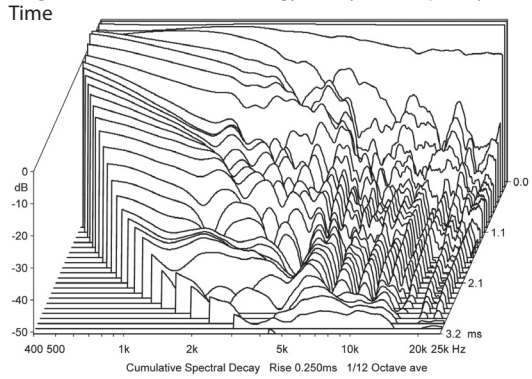
Magico S5 Mk II Frequency Responses



Magico S5 Mk II Impedance: Frequency Response and Phase (dashed)



Magico S5 Mk II Waterfall: Energy Decay for Frequency and Time



HIFICRITIC
AUDIO EXCELLENCE

Second Opinion: Jon Honeyball

The problem with moving the state of the art forward is that it is a voyage of discovery, hearing entirely new instruments, and with reproduced acoustics becoming clearer than before. Things start to get quite spooky on modern pop or jazz music, where the individual acoustics around each instrument or vocal part are laid bare. This is especially true when effects like reverb are separately applied to each instrument in the mix phase of a production.

Hearing 'more' can actually be quite disturbing, as you realise that the sound space around one instrument is neither the same size nor in the same context as the sound space around another. And yet they are overlapping in the physical space in front of you. This can be quite disconcerting, when the loudspeaker resolution allows for such easy and stress-free clarity.

This is what has happened in the move to the *S5 MkII* speaker from the *S5*. The improvement in clarity has enabled a precision of analytical listening to the soundstage presentation, to the point that any production falsification is laid bare. It's like looking at a high resolution photo only to discover that you can actually see each brick – and discern the crumbling mortar between each layer.

This is what the *S5 MkII* does. It goes deeper into a soundstage, and defines it more cleanly than anything I have ever heard, including the finest ribbons and electrostatics. This has come about because of Magico's obsession with the computer modeling and analysis of vibration and energy flow within the speaker, to a level that seems to be streets ahead of anyone else.

This is not an overly etched sound, brought on by a slightly rising frequency response adding a "two lumps of sugar in your tea" artificial sweetness. This is the absence of smear, of trapped delayed noise, and of resonance.

I heard a similar effect with the move to the Naim *Statement S1* pre-amp, both with my active Naim *DBL* speakers, and at MC's house with the *S5 MkIs*. The combination of *S5 MkII* with Naim *500DR* means that the system performance has leapt over that given by the *S1* pre-amp with NAP300 (non DR). One wonders what an *S1* pre-amp with *500DR* would bring to the party. The combination of *S5 MkII*/*500DR* clearly sets a new high level for every aspect of power amp/speaker performance. And it's what it doesn't do which is so significant. Truly less is more. It's the clearest definition of 'non-sound' I've ever experienced.

Subjective Sounds

PAUL MESSENGER

It's quite useful to have this back page available as a rolling diary, catching up with recent experiences and updating some of the things I might have overlooked. Saying that, this particular past quarter has been traumatic, thanks to multiple power amp failures. To summarise, I've been using a Naim *NAP500* with total reliability for around fifteen years (and *NAP135*s and *NAP250*s before that, going right back to the 1970s, again with utter reliability). However, I sent it back for a *DR* upgrade in mid-June, mindful of the fact that it would need 6-8 weeks running in after re-fettling, but unhappily, a week after it came back (and with Spendor's Philip Swift sitting right next to me), smoke arose from the power supply unit, due to a faulty component.

The *'500* went back to Salisbury for repair, which took a week (thanks to an intervening bank holiday), so I installed an NVA *The Second Statement* as a replacement. Everything seemed to be working fine for a few days, but then the B&W boys arrived. Everything went swimmingly for an hour or so, and I was perfectly happy using the NVA amplifier as a substitute. Until, that is, Steve Pearce slipped a techno disc into the CD player. I then got carried away with the volume control, and I blew one of the NVA's channels. Timing couldn't have been worse as the *500* was already sidelined, so I had to dig out a very old (but recently serviced) *NAP250*, which happily worked out fine.

The *500* came back and I used it for another three weeks before I discovered another problem. This only revealed itself when I wound up the wick and started using serious power, whereupon one channel showed signs of instability. It was back to Salisbury for another week or so, and the problem this time turned out to be faulty soldering of a power transistor in the amplifier itself.

I'm not going to complain, as this is the first (and second!) time I've encountered any reliability problems with Naim components in forty or so years. And the *NAP500 DR* certainly sounded particularly good when it came back the second time. But the toing and froing has certainly chucked an unexpected spanner in the running-in and hence the reviewing procedures, for which I should apologise.

Why do I always discover niggles with digital audio devices after I've already written about them? I was certainly happy enough at getting Arcam's little *irDAC-II* to sort out my digital sources when it came to writing last quarter's *Subjective Sounds*, especially as it seemed to have sorted out the mild irritations I'd encountered with the *Mk1* model.

Now I've found a new niggle that certainly affects the practicality of the *MkII* version. It doesn't seem to affect the co-ax or optical inputs that are used for my server and TV respectively, but the problem seems to involve the USB input which is normally used for my lap-top. If I switch the DAC on after the lap-top, all is well, and the lap-top recognises the presence of the DAC. However, when I shut down the lap-top and go to bed leaving the DAC on, the lap-top sometimes no longer recognises the Arcam DAC. In practice this can be rather inconvenient, as I tend to leave the DAC permanently 'on', but shut down the lap-top overnight, with the result that it sometimes (and somewhat unpredictably) loses the connection.

I also owe Andrew Rothwell an apology, for completely ignoring the M-C cartridge loading adjustment that is available on his *Headspace* step-up. It was only after we'd gone to press that I found the little bit of paper that told me to open up the unit and make the required adjustments to match cartridge and load...