

HIFI CRITIC

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MAGICAL MAGICO

Martin Colloms' enjoys a close encounter with Magico's S5 floorstander

AXJET BY AXHORN

Paul Messenger discovers a unique horn speaker system in the heart of Wales

ANALOG DIGITAL?

Chris Bryant checks out MSB's claims for its new Analog DAC

THE SPECIAL ONE

PMC has upgraded one of PM's favourite speakers, so how good is the IB2 SE?

LONG LIVE SUPERNAIT 2

The new Naim SUPERNAIT 2 has fewer features than its predecessor – and with good reason

HEADPHONE EXPLOSION

Comparing newcomers from AKG, Yamaha, Jays, B&W, Sennheiser and Focal, against established references

REVIEWED THIS ISSUE: MAGICO S5, AXHORN AXJET, AURENDER W20, PMC IB2 SE, RAIDHO D-1, NAIM SUPERNAIT 2, MSB ANALOG DAC, FENSON ISO, AKG K550, AKG Q701, YAMAHA HPH-MT220, YAMAHA HPH PRO 400, YAMAHA HPH PRO 500, α-JAYS FIVE, BOWERS & WILKINS P7, SENNHEISER MOMENTUM BLACK, SENNHEISER MOMENTUM BLUE, FOCAL SPIRIT CLASSIC, TRACK AUDIO STANDS, EPOS S15 STANDS, IFI ITUBE, DIVINE ACOUSTICS GRAVITY, VAN DEN HUL THE HILL, VAN DEN HUL THE MOUNTAIN



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I saw something interesting on the TV the other day, in a programme called *If Memory Serves Me Right*, made by actress Maureen Lipman. While the main thrust of the programme examined the difficulty of learning lines as one became older, a specific interview with a researcher did give me significant pause for thought.

Sadly I don't have a recording and the programme is not available on *iPlayer*, so I can't provide more than a brief recollection of the study in question, but the gist seemed to be that an individual's most powerful memories are those that are built up during the transition from childhood to adulthood – say between the ages of 12 and 25.

I'm increasingly convinced that this probably applies even more to musical memories than those of a more general nature, and as a result often goes some way towards explaining an individual's particular taste in music – at least in terms of popular music forms.

It's certainly true that much (though by no means all) of my favourite music tends to date from my adolescent years (say, from the early 1960s to the mid-1970s), and I'm also conscious that jazz fans are often a little older than I, and that punk enthusiasts tend to be rather younger.

Indeed, listening to the beginnings of punk rock at my local record shop, I recall thinking that it wasn't particularly original and strongly reminded me of early Who material. I therefore never really 'got' punk rock – but it's no surprise that my kid brother (12 years my junior) became a big fan of The Clash.

Over the years my record collection has accumulated loads of music from outside that 1962-1974 'window', much of which has no less merit than the music I enjoyed back in those early years. But there's no denying that many of my favourite discs date from that era. And on the odd occasion that I get talked into participating in pub quizzes (I've discovered that my knowledge of history and geography can be quite useful), I find myself well able to answer questions from 'my' era, but quite unable to cope with those from more recent years.

I should stress that this observation only applies to popular music. Enthusiasm for classical music seems to belong to a different part of the brain and memory entirely. I was certainly exposed to plenty of classical music through my formative years, but the composers I heard in my youth seem to have little if any relationship to my current personal preferences (for the works of Sibelius, Elgar and Wagner, for examples).

However, while I don't believe that one's preference for a particular type or era of music entirely determines one's choice of hi-fi system, it probably does have some influence. It also maybe helps explain why timing and dynamic expression seem to be much more important than imaging or tonality, for me at least, though I'm fully aware that others have quite different priorities.

Paul Messenger

Editor

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Magical Magico

MARTIN COLLOMS ENCOUNTERS THE MAGICO S5 FLOORSTANDING LOUDSPEAKER

MARTIN COLLOMS

HIFICRITIC
AUDIO EXCELLENCE

Magico has made some very large and costly loudspeakers including a massive (mainly to order) horn-loaded flagship ambitiously called *The Ultimate*, whose conception and implementation indicate that Magico's primary protagonists Alon Wolf and Yair Tamam were keen to establish their credentials as creators of a truly serious high end loudspeaker brand. It is also significant that *The Ultimate's* bass is provided by a sealed-box (infinite baffle or IB) loaded 380mm (15in) bass unit, direct-coupled to a 4kW amplifier.

The IB approach has become a Magico signature, and is seen in a cascade of designs which have emerged in recent years, from the part wood and metal *V-series* to the all metal *Q7* flagship, and smaller examples right down the *Q1* compact (*HIFICRITIC Vol6 No3*). Magico has also prototyped an extensive series of different enclosure shapes and combinations, to explore the various forms which we have seen from the industry over the years; many of these prototypes are also all metal.

The *Q1* stand mount provided our first opportunity to get acquainted with Magico, but this model was perhaps a little too small to explore the company objectives properly in our relatively large (25x35x9m) part open-plan listening room. Larger and more costly *Q-series* models were one option, but we favoured a sub-£35,000 model from Magico's new and somewhat less expensive (if still pricey) *S-series*, which replaces the part-wood *V-series* models.

The *S5* has pricetags that start at around £30,000, depending on finish. Still all-aluminium, the build is essentially new in order to provide a more competitive price point. This floorstander has two 250mm (10in) bass drivers per enclosure [equivalent to a 370mm (14.5in) unit], which was thought likely to be sufficient to prove Magico's point in my large room. The point being that sealed-box (IB) designs, have a particular musical quality which cannot be gainsaid, despite the implied if modest penalties incurred in respect of bass power, sound level and efficiency. Technically, the time response should be faster for sealed than for a ported enclosures because its group delay is much lower, and (taking into account room matching variables) low group delay ought to deliver more accurate rhythm (see feature in this issue). This

desirable situation is not a given, as it also relies on two other factors: a well judged midrange timbre that voices transient sounds properly; and in achieving a good match to the overall room acoustic. But get all of these right and an involving, upbeat and entertaining sound should result.

Some historic loudspeakers have achieved this low group delay result with famously good timing, albeit often at some cost to traditional audiophile qualities of image transparency, sharpness and scale, and low coloration. A classic high quality sealed-box design was the Yamaha *NS1000*, which is still respected by many fans; Magico, through heroic engineering of enclosures and crossovers and its custom drivers, aims to address similar audiophile issues. By coincidence, Yamaha was an early adopter of beryllium diaphragms, for its tweeter and midrange domes, while Magico's *S5* also has a beryllium dome high frequency unit, alongside a carbon composite cone midrange unit.

Strong operators were required to install these very heavy loudspeakers, which come in massive crates with integral shock isolation. The high quality paint finish with optional piano gloss, sprayed onto a hard alloy carcass, is necessarily quite fragile, and careful handling (watches and rings removed) is essential. Integral concealed steel inserts now take a friction-fitted felt-decoupled, surface-mounted, full height perforated metal grille.

I approached the task of assessing this loudspeaker having already been previously warned about its relatively low load impedance. The loading really does drop to a 2.4ohms minimum, so this must be regarded as a 4ohm design (as the factory rating suggests). It requires amplifiers with both good peak current potential and a massive enough power supply to avoid bending under heavy low frequency transient demands. This speaker should take 500W/8ohm peak program, which translates to a peak current of 35amps at its lowest impedance – momentarily perhaps on program material, taxing certainly, but by no means impossible for a good power amplifier. (Some mitigation will result from its closed box alignment, which helps make the impedance more stable in the face of music dynamics.) (Current requirements are related to amplifier power, so a 100W amplifier will

deliver a lower output voltage and thus a reduced maximum current; a 15amp amplifier peak current rating would suffice here.) For examples, at 250W maximum a D'Agostino *Momentum Stereo* has the necessary reserve, as does a Naim *NAP 300* at its nominal 100W rating.

The *S5*'s bass driver pairs are equivalent to a 370mm (14.5in) unit, which is about right for full blooded bass in good sized rooms. The *S5* bass drivers actually exceed the 14in equivalent area used in the Wilson *Alexia*. Another comparison is with Magico's own larger, heavier and more costly *Q3*, which has three 7inch bass drivers in parallel but, slightly less low frequency radiating area than the *S5* (though I suspect those more costly bass drivers have greater linear excursion and thus a greater linear peak output).

Technology

The bass drivers might be based on OEM platforms but are totally Magico in execution, with thick anodised aluminium alloy piston cones reinforced by large Magico nanotechnology-reinforced CFC centre domes. A massive half-roll surround together with a fully modelled magnet and motor design provides an extra long throw for powerful and deep bass. The midrange and treble drivers are entirely Magico, the former a short-coil long-throw design for very low distortion, inductance and coil mass, and composite nanotechnology cone. The 25mm (1in) tweeter is also used in more costly Magicos, but is here built for front panel mounting. Crossovers are tailored to deliver flat pass-band responses with superior and symmetrical phase summation, and faster out-of-band roll-offs using modified 'elliptical' filters. Copper foil inductors and special Mundorf capacitors are used. The five-way copper alloy terminal pair is also by Mundorf, and is nicely accessible for firm tightening. Custom single-strand wire of various gauges connects the interior components.

Economies have been made here by reducing the huge 'machining from solid' workload and material waste of the *Q-series* by adopting sections of cut extrusions. However, even this example still has lots of metal due to the substantial aluminium internal bracing, as the considerable weight indicates. Multiple fixings for the drivers provide rigid connection with the ultra strong enclosure baffle.

Sound Quality

The *S5*s took a few days to reach room temperature after delivery, whereupon experiments with room placement could begin. In fact the well controlled bass character seemed rather more tolerant of

location than usual, and the speakers were easily positioned for even extended bass and satisfying stereo images, with useful variations available to taste. This speaker has such an even temperament one is not aware of how loud it is until trying to communicate with an adjacent listener and finding it necessary to shout!

The character does not change much with loudness: the soundstage simply gets larger and deeper and the bass sounds more extended following the laws of psychoacoustics. Such imperturbability inspires trust and confidence, and indicates very low distortion. We grew to admire its remarkable evenhandedness on all classes of digital programme, and at all reasonable sound levels.

Following my introductory remarks on rhythm and timing for larger IB loudspeakers, we should immediately inquire whether it can rock. The answer is emphatically that it does. Few high end speakers dig really deep with R'n'B and jazz material – it seems that the pursuit of musical beauty, transparency, lifelike dynamics detail and spaciousness provides sufficient intellectual reward for many designers and customers. Yet a number of listeners also crave a greater feeling of involvement from their music systems, and here the *S5* really delivers, with highly articulate bass lines that are powerful, deep, dynamically resolved and really fast.

The low frequency octaves keep pace with the midrange, underpin the beat, drive the music forward, and draw in the listener – and not just on rock material. This dig-in-deep effect is also unmistakably present with well recorded classical material, particularly older recordings done with relatively few microphones. I found it gave great emotional satisfaction, as much from its upbeat and involving drive as its undeniable 'audiophile' abilities. The speakers could take upwards of 250W of material with heavy bass without limiting or significant audible distortion – just thundering louder and louder. Furthermore it cannot be made to shout, as many speakers do when driven unduly hard.

Although it's not theoretically desirable, most speakers have some sort of 'character' or timbre, such as 'forward', 'present', or 'laid back'. Some have a projected midrange, which adds impact to percussion. However, I could not pin any such characteristic on the *S5*, even using master quality material, so neutral is its inner balance. I could alter the sound with the usual tuning steps: wall placement niceties, and adjustable local absorption (mats, carpets and the like on my hardwood floor), and the effects were notably unambiguous. Each time I made an adjustment, it was clear that the

sound output of the speaker remained in control. It was also evident that this speaker's bass was rather less affected than usual by the low frequency room modes that are inevitably present. While this helpful behaviour is normal for sealed-box designs, and still more so with higher moving mass bass drivers such as these, it was illuminating to test that theory with this design. The *S5*'s bass is usefully more tolerant than usual to different room types and settings.

Finer timbre and focus shadings may be found by adjusting toe-in; my personal preference was about 10 degrees outwards from a direct axial alignment, the included angle from listener to speakers about 75 degrees. Preferred wall spacing was about 1.1m from the side walls and about 1.5m from the front of the speakers to the wall behind. The bass is quick, tight, and ample: in fact there might be a little too much for smaller rooms. (Here the smaller anticipated *S3* with its equivalent 12inch bass driver might be more suitable.)

Time and again I forgot that I was listening to acoustic machinery: the *S5* experience is rather more like a very good low distortion amplifier. It has a creamy, grain-free midrange, with no edginess or hardness, a virtue reminiscent of the Quad *Electrostatic* at its best. Indeed, the *S5* sounds so smooth that some listeners may feel that it is lacking in some 'jump factor', but I feel that the music, not the transducer, should supply this.

While continuing to analyse the sound, I also noted that there was no upper midrange cone 'cry' or ringing, common with normal speakers, nor a 'hardening' upper peak as the crossover transfers input power from the midrange to the treble driver. In this example the transition from bass to midrange is also audibly seamless. Lacking these common signatures you could say that the *S5* is rather lacking in character, and you would be right, but for all the wrong reasons. Nevertheless, some may find it lacking in the usual but arguably false bite and attack, which can appear to add energy and excitement to loudspeaker reproduction.

It excelled on complex percussion material, where a mass of active musical parts were unravelled and laid out clearly in contrapuntal harmony and with amazingly well syncopated timing. And if you thought the bass timing was pretty good, it is matched absolutely in the midrange and treble.

If there is any suspicion of 'voicing' I could say that it sounds 'just right' with the finest replay format currently and readily available (digital, 24bit/192kHz). It also replayed the bulk of my valued CD-originated material in very good order, but was considered slightly less optimal



with LP. (Only a few vinyl cartridges provide a near flat frequency response, and even then cutting equalisation, plus end of side tracing loss at higher frequencies, mean that LP records tend to sound 'dimmer' than digital.) The *S5* made no excuses, performing like a monitor and reading different cartridge characters and tonal balances accurately, but not compensating in any way. Yet even following digital sessions and after a little aural acclimatisation, the *S5* clearly portrayed the virtues of vinyl, reaching back to the aurally friendly sound of historic all-analogue recording chains. The amazingly well controlled transient response of this



loudspeaker was confirmed by its exceptionally low surface noise and ticks, and again it behaved rather like a good electrostatic. The sealed-box design also meant that there was no excess cone excursion with disc warps, while LP bass lines were exceptionally clear and well timed – close to the state of the art. In fact the bass lines on dozens of '70s rock albums were replayed in my room as never before. It was also clear that the fine uniformity and control improved both the subjective noise floor and also the turntable feedback margin, increasing the available dynamic range, a most welcome bonus. Even so, some experiment with cartridge choice may be required to find the optimal timbre that is a comfortable foil to the very natural sound demonstrated with hi res digital recordings

With a speaker that has so little character, it becomes hard to qualify its sound except through perceived quality of the music played through it. On many occasions I was reminded of the aurally caressing yet vital quality heard when listening to top class open electrostatic headphones, albeit now with the room acoustic active. It offers the lowest level of listener fatigue I have yet encountered under £100,000, and tells very clearly how micro resonant and 'noisy' many loudspeakers are. We found that we could listen for hours on end, and I wondered whether the laboratory report would provide any clues to its exceptional sound quality.

One listener stated that he found the S5 too lacking in character and that he wanted more bite, more 'loudness related dynamic expression'. My guess is that previous experience with familiar

material had led to an expectation of a certain sound quality at a particular loudness, and that the usual 'wham bang' effect was not sufficiently present in this case. (Big electrostatics can produce a similar reaction.)

While the mid and treble is quite excellent I found myself drawn again and again to the exceptional bass, perhaps because so few designs approach such quality in terms of cleanliness, power, depth, tune playing and agility. It was as if these parts of the frequency range which had always been somewhat obscured were now rendered transparently, with masses of detail and properly differentiated character. You cannot judge how important this is until you hear it clearly in this way. Every bass instrument is imbued with speed and character, with a resolution of detail that we are more used to hearing from a very good midrange.

As listening progressed we found that we could listen back through the audio chain, which was not always advantageous, since even the more subtle faults and character traits in each component could now be readily heard. Worse still, painstaking trials, permutations and combinations of sources, controls, amplifiers, support and cables made it clear that this speaker was actually less coloured than much of my carefully chosen reference equipment, both individually and in combination. This discovery was unprecedented in my experience.

Finally we tried the grilles, which might well be essential when cleaners, clueless visitors or small children are around. Such is the standard attained without the grille, it proved all too easy to hear the relatively massive sound quality destruction that resulted from adding it. Substantial coloration resulted, with a loss in transparency, focus and dynamics, and a strange acoustic fog seemed to form in front of the speaker. But it's clearly worthwhile protection for parties (800 dollars has been quoted to replace a pair-matched tweeter)!

Lab Results

Compromises were necessary for the lab testing, as this heavy beast could not be elevated for measurement, and as usual the least 'joined up' area for the graph is 200Hz to 1kHz, where gated in-room measurement is unavoidably weak. Nevertheless the investigation proved interesting and rewarding, and turned up some remarkable results.

The frequency response is the most uniform I have ever measured for a loudspeaker. The driver outputs are so well married electrically and acoustically that the exact microphone location proved relatively uncritical. The 1/3rd octave

weighted primary axial response is an amazing $\pm 0.5\text{dB}$ from 100Hz to 25kHz. A rise to +3dB by 32kHz marks the well damped ultrasonic dome resonance, and falls to -6dB at around 42kHz (at an optimal 7.5 degrees lateral). Contrary to other reports, my samples measured a reasonably high 88dB/W sensitivity, though the lower than average impedance will require a current capable amplifier. Solid state amplifiers will be preferred, though some very large valve amps may also be suitable (such as some VTL monoblocks with over 15A and some 200W rated power per channel). Pair matching was excellent, within 0.5dB for overall loudness and $\pm 0.4\text{dB}$ for pair difference over frequency. It simply does not get any better than this.

The system's bass resonance was a desirably low 26.5Hz, the impedance peaking to a moderate 35ohms, while the loading is then quite uniform for higher frequencies with a low reactive content. A minimum of 2.4ohms at 63Hz was recorded, above which the average impedance is about 5ohms, and did not exceed 9ohms. The phase angle of the load is usefully better than 30 degrees right down to 50Hz though it has a high 72 degree reactive content at 40Hz, the worst case reactive combination. Evaluated in the nearfield the bass was very well extended, measuring -6dB at approximately 30Hz, giving powerful in-room extension to 25Hz.

Promising independent indication of this model's low distortion was seen in the NRC data accompanying a review in the Canadian web-mag *Soundstage*, and since I'm on record as having observed a correlation between timbre, transparency and typical speaker distortions, here was an opportunity to see whether the favourable subjective characteristics actually correlate with my data. My distortion test results are unequivocally quite exceptionally good, and highly consistent over frequency and any sensible dynamic range. I had to take extreme care with the instrument settings to make sure that these did not result in higher readings than for the loudspeaker itself. I mainly used nearfield readings to improve the dynamic range, having first identified the crossover frequencies at 250Hz and 2.5kHz, and checked that each driver did not have distortion which could overlap the adjacent frequency range.

The figures speak for themselves. At a fairly loud 1W 88dB SPL sound level and from a low 100Hz to 15kHz the total harmonic distortion was typically less than 0.2%. The more critical and aurally contentious third harmonic component, which can have a 'hardening' effect on subjective timbre, was typically 0.05% or better, an

extraordinarily fine result that shows great attention has been paid to this factor, and almost ten times better than the figures typically found. The S5 also showed very low levels of higher harmonics, which were consistently better than -76dB (0.005%).

Above 200Hz distortion was an almost vanishingly low 0.05% total for 85dB SPL. My worst case figure for third was at an abusive 98dB SPL, where distortion reached a still excellent threshold of 0.22%. With the room shaking and rumbling at 98dB, 35Hz in the deep bass, again the more audible third harmonic remained below threshold at just 0.35%. In the midband that amazing custom nanotechnology cone driver, driven to 98dB SPL, could better 0.1% of second and third harmonics, while at a still loud 1W (88dB), it delivered just 0.001% second and 0.05% third: truly remarkable results.

Laterally off-axis the frequency response at 15 degrees held to an excellent +1/-3dB up to 12kHz, and at 30 degrees to 10kHz. Even at 60 degrees lateral the output held to +2/-3dB until 7kHz, showing quite remarkable power integration, which bodes well for the uniformity of the power response. Measured at 15 degrees above and below axis, it showed fine symmetrical control with no peaking, and very little variation below 18kHz. The inevitable dip in the mid-to-treble crossover region also proved nicely symmetric and averaged a very mild 4dB (rather less than found with most other loudspeakers). This is evidence of careful design with fine control of driver phase and power integration through the crossover region.

The multiple averaged room response showed some of the usual and inevitable interactions. However, the bass continued down to a low 25Hz, notably without the usual upper bass boom. 100Hz to 7kHz was exceptionally uniform

HIFICRITIC Loudspeaker measured lab test results

Make	Magico
Country of origin	manufactured in the US
Model	S5
Type	all aluminium, moving coil, floorstanding, sealed-box
Drivers	2x250mm alloy/carbon bass, 160mm carbon midrange, 25mm beryllium treble
Sensitivity	88dB/2.83V (ie 8ohm watt) measured
Amplifier load	4ohms typical, 2.4ohm min; fairly tough loading
Frequency response, axial	40Hz to 21kHz $\pm 2.0\text{dB}$ (listener axis); excellent tolerance
Frequency response off-axis	Excellent: see graphs and in-room response
Bass extension	30 Hz -6dB, (25Hz, -6dB in-room limit)
Max loudness	111dBA for a stereo pair in room
Power rating (max, min)	400W, 50W
Placement	Free space, spike coupled to floor
Finishes	satin grey, various lacquer colours on aluminium
Size (HxWxD)	122x38x36cm
Weight	86.3kg, 190lb
Price per pair	From £30,000



Review System

System: Krell *Evo 402E*, D'Agostino *Momentum Stereo*, Naim *NAP300* power amps; Audio Research *REF5 SE*, Townshend *Allegrì* control units; MSB *Platinum Signature DAC IV* with *Diamond* supply, Metrum *Hex* DAC; Naim *UnitiServe* network server and S/PDIF source; Naim *NDS* streamer-DAC with *555 PS*; S; Linn *LP12 (Keel, Radikal)*, Naim *ARO*, Koetsu *Urushi Vermilion*, Naim *Superline! Supercap* vinyl; Wilson Audio *Sophia 3*, Quad *ESL63*, BBC *LS3/5a* (15ohm) speakers; Finite Elemente *Pagode Reference* racks; Cardas *Golden Reference*, Transparent *XLmm2* and NAC *A5* cables

in the listening zone and with only a mild and not unexpected decaying response extending to 40kHz. The mildly curved baffle clearly helps reduce lateral diffraction.

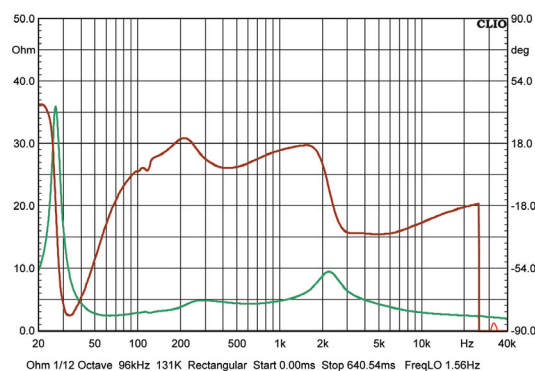
The waterfall representation of energy decay with frequency and time showed an early response that was desirably close to linear phase, followed by very rapid and uniform clearing that indicates low stored energy. The decay floor has some barely identifiable clutter that partly derives from the compromised test arrangement, and also delays caused by the spaced three-way driver topology, but very little that could be ascribed to driver misbehaviour. I ran a decay analysis for a nearfield acquisition for the midrange drive and got a truly exceptional result, with a single minor decay ridge at 5kHz vanishing by 2mS, this observed result also necessarily including the crossover tailoring and rolloff slope. Technically this is a very low coloration system with fast transient responses, a comment that includes the amazingly rigid and acoustically dead enclosure. With music playing, a stethoscope directly on the cabinet provided only a hint of the original signal, free from resonances or ringing.

Using nearfield measurement and careful positioning in the room, low frequency group delay was estimated at a very low 3 milliseconds at 30Hz and just 1mS at 50Hz – very good results by industry standards and confirming the excellent bass timing heard.

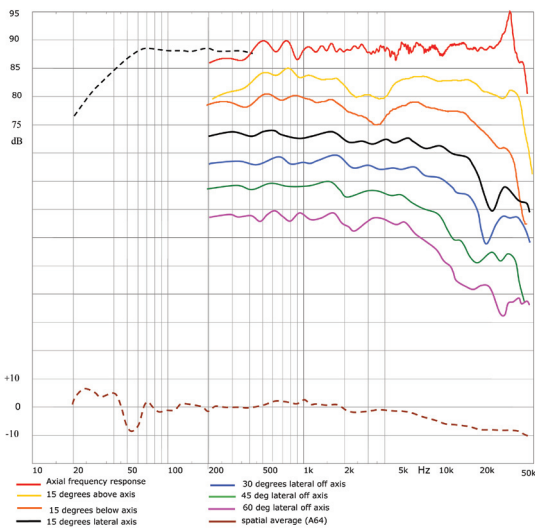
Conclusions

By now I had begun to feel that this loudspeaker has set out to measure this reviewer and not the other way round. So, have I fully captured what it is and what it can do? Probably not. The laboratory results are simply exemplary, aside from that fairly severe (though not uncommon) 4ohm amplifier loading. But it's clear that the *S5* is the product of years of careful research into materials technology, room matching, decay resonance, group delay and distortion control, a concerted global approach to total loudspeaker system design to try to make the loudspeaker disappear and thus not constitute the usual, recognisable and characterful link in the sound reproducing chain. In achieving this very high standard of natural dynamics, very low distortion, vanishingly low coloration, very low fatigue, exceptional transparency and an almost magically powerful, speedy, upbeat bass, the Magico team should be applauded. Incredible as it may seem, in the high end arena the *S5* is actually rather good value, as its complete performance reaches massively beyond its price.

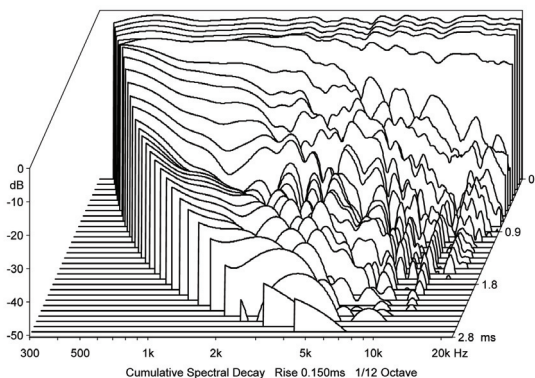
Magico S5 Frequency Response Impedance (green) and Phase (4 ohm load)



Magico S5 Frequency Responses



Magico S5 Waterfall Presentation of Energy Decay with Frequency



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Our independence from product advertising allows us to criticise and comment without fear or favour. The HIFICRITIC team scrutinises interesting and internationally important issues and equipment in depth and detail, technically and subjectively, and provides comprehensive investigations into the key issues facing high quality stereo music recording and reproduction today.

Martin Colloms, Publisher

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We call it 'globalisation', but that's just a blanket term for a huge number of factors that have led to much of our hi-fi equipment being manufactured outside the UK. Take your pick from the relative importance of the invention of containerisation, the massive political changes that have taken place across Eastern Europe and the Far East, and the business consequences of those changes, but put them all together and you're in the modern world where hi-fi equipment may well be designed in Britain, but is probably destined to be manufactured somewhere else in the world, where material and production costs are lower.

However, the situation is in constant flux. China has been the manufacturing source of choice for many companies in recent years, but its increasing prosperity is starting to erode its competitiveness, transport costs are rising, and Western companies often seem to have struggled with communication issues relating to quality and tolerances.

It's for those reasons that a number of brands are currently exploring alternatives. When I visited Sofia in Bulgaria a year ago, I was startled to hear that a Hewlett Packard factory in the city employed thousands of people, so Eastern Europe is clearly one obvious zone to consider. To generalise, standards of education tend to be good and cultural similarities ensure decent communication, along with modest labour costs and flexible transportation.

That's the reason why my fellow listening panellist Russell Kauffman has teamed up with Polish associates to create his Russell K brand of speakers. I'm not sure that the choice of brand name is all that promising, but its debut loudspeaker, codenamed *RED 100*, is itself very interesting. I can't say whether it will be commercially successful – it might prove to be a little too unfashionable for its own good – though it does unquestionably tick all the audiophile boxes.

So who is Russell K? He has vast hi-fi industry experience, working for a number of established hi-fi companies. He also spent a number of years travelling with well known loudspeaker designer Robin Marshall to my regular 'blind' listening panel tests.

Chatting with Marshall on those journeys probably provided some of the inspiration behind the *RED 100*, which might look like a regular port-loaded compact stand-mount, but is actually rather unconventional in various important respects.

First impression is that this speaker feels exceptionally solidly built, which is confirmed by the substantial weight of around 11kg. This is partly because two hefty horizontal partition braces above and below the 160mm main driver are drilled with small holes to add some acoustic resistance. The port here is tuned to a low 32Hz and the internals are quite deliberately left entirely undamped. High quality crossover ingredients are used, and the cosmetics are certainly unusual too, our samples featuring a heavily textured finish on five faces and a red painted front panel.

There wasn't time to carry out a full review of this speaker, but initial results were distinctly promising, with the sound showing fine timing and coherence. The in-room measurements gave best results when the speakers were well clear of walls, whereupon they demonstrated good sensitivity with fine bass extension, albeit with some emphasis around 800Hz. And the load looks easy enough to drive, even though it does fall somewhat at high frequencies.

By combining a fairly complex UK designed enclosure with low cost Polish manufacturing, the *RED 100* can be sold for a relatively modest base price of £900/pair. And those who want fancy wood veneers, grilles and so on can specify them as extras.