

# FinkTeam KIM

UNUSUAL IN DESIGN AND IMPLEMENTATION, AND AGAIN NAMED AFTER A *STAR TREK* CHARACTER, THE LATEST ARRIVAL FROM THE SPEAKER-CONSULTANTS-TURNED-MANUFACTURER IS ITS SMALLEST – AND MOST AFFORDABLE – YET. HAVE THE MORE COMPACT PROPORTIONS BEEN ACHIEVED WITHOUT COMPROMISING PERFORMANCE? MARTIN COLLOMS INVESTIGATES IN-DEPTH

**We much enjoyed the challenge presented by the Borg, an earlier design from FinkTeam, (HIFICRITIC Vol13 No4, Oct-Dec 2019). That was the second in-house loudspeaker from the Karl-Heinz Fink design team, following their big three-way design skills demonstrator, the WM-4. About a year later FinkTeam has delivered KIM to the market – a more compact design with a two-way bass reflex enclosure, supplied complete with an integral, square, hollow section steel stand of distinctive ‘slant back’ geometry, intended to aim the optimum treble unit axis at the listener.**

Named, like Borg, after a character from the *Star Trek* TV series, and selling for £8900/pr, KIM is a classic concept, with more than a hint of reference to the BBC monitor LS 3/6 of nearly half a century ago. That circa 1968 design comprised an advanced eight-inch/200mm bass/mid driver (with a surface damped moulded co-polymer cone), working with an unusual, pistonic 38mm primary high frequency unit. By original design, this tweeter was acoustically front-loaded by a distinctive equalising grille.

The LS 3/6 monitor was exemplified in large commercial volumes as the standmount Spendor BC1, manufactured by the designer and Spendor founder Spencer Hughes, and later augmented with a 19mm super tweeter to extend the range to 25kHz. KIM differs in that while it has a 200mm bass-mid driver, the single high-frequency unit is an AMT air motion transformer, a form of Heil ribbon.

Often speaker makers are not too keen on stands, and floorstanding designs have become more popular in recent years. If not supplied by the manufacturer, stands are an unwelcome variable which can affect sound quality; if they are supplied, they may be viewed as adding more complication and expense. Yet there is a certain quality to a standmount loudspeaker design, with sounds in the broad midrange frequently seeming better able to free themselves from the acoustic effects of the local reflective environment especially the floor boundary.

The stereo image can gain a natural sense of elevation, with improved focus and better definition while the lower midrange may pick up speed and articulation, often making up for a possible loss in lower frequency weight. Vocalists and musicians rarely lie on the floor, but almost invariably perform standing or seated. When recorded programme is thus reproduced off the floor by employing a stand at nearer to conventional performance height, the

result may well sound more natural and show a more convincing spatiality.

The early prototype KIM looked rather ungainly with its original semi-integral, part-cabinet support, the latter aspect associated with the front elevation, but now two distinctive features have emerged. These comprise a new, separately constructed but integral lightweight stand: almost vestigial, with hollow slim welded box steel sections, the design also gives the speaker a gentle upward tilt, this orientation providing a less symmetrical – and thus more neutral – radiation envelope.

## The tilt advantage

The tilt back also aids the time alignment, thus optimising the overall sound output arriving at the listener. Differential adjustment of the front and rear spikes provides some accommodation for distance and seated head height. Initially I found its appearance disconcerting but got used to it during the evaluation.

Primary specifications include overall height (with stand) of 85.4cm, plus width 30cm and depth 31cm, the latter increasing to 42cm including the projection resulting from the stand tilt back. Each assembly weighs 25.1 kg complete, evidence of quite a dense construction, and KIM comes with adjustable rounded point floor fixtures and floor engaging spikes these in a 6mm thread format.

There's a rectangular, low noise, low frequency 'reflex' tuning port on the rear panel upper section. Connection is for single wire cables, made via heavy duty, nicely ergonomic Mundorf 4mm socket/binding posts turned from solid copper. Also, like its big brother Borg, KIM includes some valuable electrical user adjustments to help fine tune the loudspeaker parameters to better match both listening room and amplifier.



“Named, like Borg, after a character from the Star Trek TV series, KIM is a classic concept with more than a hint of reference to the BBC monitor LS 3/6 of nearly half a century ago



### Fine tuning

The control element of the crossover network is distinguished by additional ‘bypass’ sub-sections which deliver significant system flexibility for the user, room, and overall system voicing. There’s a three-position high frequency level adjustment for room acoustics, which will also partially control image perspective, as well as helping fine-tune system character, for example influenced by sources, amplification and cables.

And there is also control of lower frequency level via a ‘damping’ adjustment, here electrically variable via a three-position switch, offering subtle adjustments for subjective ‘punch’ in the upper bass. This caters for positioning and local room acoustic variations, including room size, and also – if indirectly – fine-tunes low frequency weight and attack, improving the matching to some valve amplifiers with reduced damping factors.

The ‘bypass’ feature means that the main power to the drivers is hard-wired and that only fractional secondary power is routed through the controls.

Also, for those with Roon-equipped digital audio replay, there is a subtle bonus on offer whereby an account holder may invoke compatible delay-compensating filter software designed by FinkTeam, and invoked in the digital music streaming path selected specifically for KIM replay. This compensation software comprises two components, the first ‘filter’ compensating for the group delay of the passive crossover in the upper midrange.

This is termed ‘excess group delay’ and subtly affects image depth, focus and timbre, while the second component is a compensation for the overall group delay resulting from the inherent high-pass low frequency alignment, common to almost all loudspeakers. For KIM this intrinsic delay is a moderate 15-17mS, but with the software filter invoked via Roon this reduces to less than 2mS, resulting a rather close approximation to linear phase. Under ideal conditions such delay compensation, leading to a more perfect impulse response, offers an improvement in subjective low frequency musical timing and ‘poise’, rather better

### The System

Naim NAP500DR power amplifier, Constellation Centaur II Stereo, Linn LP12 player with Keel chassis and Radikal motor control, Naim Aro arm, Lyra Delos Cartridge, Naim Superline DR phono pre, Townshend Allegri Reference and Allegri Plus autotransformer line control, UnitiCore network server and S/PDIF sources, ROON Nucleus Plus with Qobuz HD; NAIM ND555 Streamer-DAC Dual 555 PS(DR), Meridian 200 CD transport, Wilson Audio Sasha DAW, Magico S-5II-SPods, Quad ESL63, BBC LS3/5a (15ohm) speakers; Naim FRAIM and Artesania audio racks; Transparent XL MM2, Crystal Ultra Diamond, Naim NAC A5 speaker cables, Naim Super Lumina, Transparent MM2 and Van Den Hul Carbon TFU interconnect cables.

experienced than explained. However, unless noted otherwise for comparability, all the listening test results here were derived without this correction.

As Karl-Heinz Fink notes, "We supply these software filters free of charge. It's still a work in progress, but we like it and we thought it could add something extra to a passive speaker that normally is impossible to have." By the way, users of the company's Borg speakers can now invoke similar matched delay-compensating filters in Room.

We've reported on the related custom delay compensation offered by Devialet for numerous loudspeakers (a component of that company's SAM low frequency control and processing), a feature we assessed with the Magico S5II. We also successfully auditioned the linear phase compensation options provided with the active three-way standmount Kii3, and also the KEF LS50 and KEF LSX.

FinkTeam conservatively specifies a nominal frequency range of 45Hz to 23kHz, -6dB, for KIM extending to 35Hz and 25kHz 'overall' for -10dB. The 'average' impedance is 8 ohm, with a minimum 5.9 ohm @160 Hz, very slightly dependant on those 'tone' control settings, and it comes with claimed sensitivity of 86dB/watt, again an average for the industry. However, if the design had been compromised to a lower impedance, as so many are, the sensitivity could have been 89dB; I prefer it as it is. The crossover between bass-mid and treble units is set at a low 2.2kHz for best integration of the driver outputs.

### A choice of finishes

KIM is offered in a range of finishes to order, including: Amara Ebony or Matt Black with a black front baffle, American Walnut with black or white baffle, or Matt White Matt with a Steel Grey baffle. In each case the baffle is finished in a 'soft-touch' matt lacquer, with piano finishes and other veneers/front colours/differentials available to special order. At present the stands come only in satin black.

Such standmount systems are usually flexible regarding placement in the room, in this case a spacing of 0.6-0.8m from the wall behind the speakers helping optimise midrange clarity and focus: too close and the image depth suffers. About 1.1m from the side walls would also be a good starting point for the most stable stereo image, but be prepared to experiment while also varying the distance to the listening seat. Good imaging is available for two or three seats, but when a listener is centrally placed it really does snap into focus.

### Sound quality

I tried the KIM in two room orientations, in the large bay normally occupied by the Magico S5 II, and then also on the side opposite where the longer wall extends to 25 feet. Both positions

proved viable, raising confidence in the speakers' inherent neutrality and indicative of a dependable off axis sound output. There is little ambiguity in the presentation even with complex, wide frequency sounds, and listeners settled in quickly.

First impressions were of classical timbre, neither bright nor forward, and almost polite compared with many offerings on the market. Some designs seem to be shouting for attention with their thumping bass, excessively projected midrange and intrusively sparkling treble – not so KIM, which rather lets the music speak for itself.

### Self-effacing

This loudspeaker is so self-effacing that quite some concentration was required to attempt a characterisation, and much of this will come later – for now, I will attempt to describe how the music replay sounded.

KIM is obviously of classical monitor standard, with clearly-focused sources, vocalists, and instruments well-placed in generous virtual soundstages. Recording techniques were ruthlessly decoded, and simple phase-coherent microphone arrangements could be stunningly realistic. Phase jumbled multi-mic recordings were sufficiently detailed to enjoy but by comparison were exposed as something of a spatial mush.

This is one of those loudspeaker designs where it is easy to hear the back of the soundstage, determine whether the mics were well placed and orientated, also whether low-level hum and other noises were present. Image depth was exceptional while focus was maintained deep into that virtual image. While revealing of programme quality it did not exaggerate distortion or noise.

### Emotional power

When the music is playing, the technicalities are quickly forgotten as the emotional power of great performances comes to the fore. At times it can be disconcerting, discouraging a listener from becoming intellectually involved in the mechanics of replay, but that is the whole point. Ideally a loudspeaker should get out of the way and allow the programme and performances to speak for themselves: with great recordings KIM's inherent quality proves to be highly satisfying, while poorer recordings are stripped bare, and here listeners have to take their chances. It still does a better job than most in separating the music from the noise and distortion present on some material

I spent about 30 hours employing KIM as an analytical tool for comparing and contrasting numerous isolation feet/supports for the review elsewhere in this issue, finding that these speakers greatly helped me arrive at reliable comparisons

of the effectiveness of such accessories and – not least – certain sets of cables under review. However, you can easily forget all that: despite their analytical quality, these speakers don't exaggerate faults.

While the bass is truly exceptional for detail and expressiveness, despite the design's modest dimensions, the kind of extended rolling slam available from a big subwoofer isn't on offer here. Nevertheless, the low frequency output is striking, not only because it does show decent dynamic punch down to a low 38Hz, but also that KIM's low frequencies offer impressive detail. This backs an upper harmonic range which offers an unexpected tune-playing transparency which has been extended to lower frequencies.

In addition, the bass output is clearly in the room space, associated with the stereo image, not localised at the loudspeaker positions, which error is associated with a coloured or distorted bass register – emphatically not the case here.. In addition, the integration between the bass driver and port output is so well-voiced that the listener is almost never aware that this is a ported design – something I found surprising as I am often painfully conscious of misaligned reflex designs working too hard. KIM could deliver that crisp, dynamic punch in the bass so characteristic of live sound.

### Enjoying the music

Despite my audio engineer's background, I was able to forget how this speaker worked and simply enjoy the stream of music issuing forth. It was some days before I felt like grabbing a pen and writing up how it sounded: assembling my notes, which recorded the experience of literally hundreds of music tracks played on KIM, I began to feel that here was a design rather greater than the sum of its parts.

Its midrange and treble integration, and the resulting neutral timbre, is the nearest to the original BBC LS3/6 that I have heard in decades, that sense of octave-by-octave uniformity, of inner poise and satisfyingly natural timbre, also leading to an innate and believable tonal balance. The design team hasn't been afraid to trade off some out-and-out loudness in order to arrive at a commanding degree of poise and musical involvement.

Rickie Lee Jones can be a trial for many designs: her nasal, sometimes piercing projection can cut through a mix to excess, frequently prompting a timely reduction in replay loudness. KIM sailed through this test with the best replay I've yet experienced of her eponymous album, which sounded as if it had been remastered, and more.

The speakers also proved to be completely agnostic about musical style or origin, and try as I might I couldn't catch them out. In addition to the exceptional recovery of detail, they excelled in



conveying counterpoint, where several balancing musical strands were accorded their natural weight and voicing. That makes this design a great friend to jazz, helping bring these tracks alive with explicit timing revealed between the musicians, backed by crisp, agile and tuneful bass lines.

There's insufficient space here to convey all of those experiences, but notable examples include Tord Gustavsson's *Tuesday Wonderland*, which leapt from the speaker enclosures with clarity and vitality, It completely grabbed my attention, making it impossible not to tap my feet, while this design so readily puts air and dimension around the performers. Another good sign is that, when the volume is turned down, the clarity remains, the stereo image lightening in timbre as it naturally becomes more distant.

An old favourite by MJQ, *Pyramid* came up fresh, again almost as if remastered. This is an uneven mix, and one some loudspeakers fail to handle well, but KIM sailed through, delivering possibly the best replay yet heard on this recording. More than a few old favourites were presented with rather better insight into the interplay between the musicians.

### An easy listen

Listener fatigue was judged very low: you could listen for hours, and at almost any desired level. Time and again familiar recordings came up renewed, with vitality, detail, space, and expression, while inner microdynamics were excellent: this loudspeaker readily holds the listener's attention.

KIM sounds pretty good just placed on the carpet but when carefully aligned and spiked, the innate clarity is optimised, while the high level of dynamic expression and forward momentum proves infectious. Leftfield's eponymous album is superbly complex and multi-layered – I thought I'd heard it all before, and then KIM arrived to reveal still more layers, with a winning, dynamic and involving exposition of the subtle spatiality and complex rhythmic interplay to be found in this sophisticated production.

The 'torture track vocals' on *Chi Mi Na Morbheanna*, Mouth Music, were negotiated with consummate ease. Sounding fresh and crisp, with satisfyingly explosive percussion, the complex rhythms at the heart of this music were also beautifully expressed.

From jazz to ambient, rock to medieval choir, there seemed to be nothing KIM would not take on: while cathedral organ at high volume could take it close to the power limit, it still scored highly on focus, midrange definition and a sense of presence. Nevertheless, it still played louder than equivalent competition on such torture material, such was the tight control the designer has placed on the mid/



bass driver at low frequencies. It continued to surprise on familiar material, for example revealing a subtle second harmony previously unheard on a familiar vocal piece – so spooky!

Late in the review I sampled the effect of the 'advance' computation for linear phase and group delay compensation available via Roon: this could be the icing on the cake, taking the character closer to the best part of the Quad ESL – even though many won't notice it that much, as KIM is already so good. With correction invoked, the bass sounds even less coloured, and has more impact, with better transient timing and coherence. The soundstage is a tad clearer, more focused and with better layering, and the sound is somehow more 'natural', closer to live quality, and with better timing. It also reaches out to the listener a little better. The correction option isn't a make or break matter – but if you have the means, I suspect that you will always prefer to leave it invoked.

### Conclusions

KIM may be half the size and price of Borg, but offers much more than half the performance, a compact stand mount design well beyond expectation, even for a Fink design. As revealing as a broadcast studio monitor, it conveys so much information about music production and programme content, and also proved adept as a tool in the evaluation of audio products. The lab test results are exemplary in all respects, but especially in respect of frequency accuracy, pair matching, colouration, and distortion. The potential for delay and phase correction in real time via Roon adds both value and performance, but beyond this, KIM's infectious well-timed musicality takes sound reproduction beyond mere process, to achieve a higher level of listener involvement and satisfaction.

It wins the HIFICRITIC Audio Excellence Award, and does so triumphantly.



## KIM Technology Story

### The Drivers

Many of the details seen in the larger Borg design have been carried through to the smaller KIM: for example, the bass-midrange driver similarly uses a computer modelled diaphragm of bonded fibre pulp composition, of critically formulated internal damping. It has smooth matt-black polymer finish and quite a shallow, 'open' flare.

The surround is a generously- dimensioned half-roll, completed by a high-loss damping fillet at the potentially problematic cone-roll junction; this is where a resonance might occur, and frequently does in other designs. The surround supports this lower-mass paper/pulp composition diaphragm of graded thickness and density, a 90 year old technology which, in this application, Finkteam prefers both to layered composites and also to moulded polymer formulations.

Nominally a 200mm/8-inch driver, with a 160mm effective swept diameter, this does not have the classic corrugated edge suspension seen in the larger Borg. For the KIM design that half-roll suspension was deemed essential at this smaller size to deliver sufficiently powerful bass of good mechanical Q factor. This driver is designed for considerable linear excursion consistent with good power handling.

Built on a heavy duty die-cast alloy chassis of open geometry, the mid/bass unit employs a generous ceramic magnet whose magnetic flux is firmly linearised for long coil excursions with the aid of stray-field-controlling aluminium conduction rings, allied to a high conductivity copper cap over the magnet pole. Together these features minimise the aurally more intrusive third harmonic distortion, and additionally increase dynamic range.

High frequencies are handled by a special low-distortion 'ribbon' tweeter of AMT Heil technology, co-developed by Finkteam with audio parts specialist Mundorf. Built on a heavy, machined alloy faceplate this essentially planar, horizontally pleated, lightweight 'ribbon', has an effective radiating size 20mm wide by 80mm high.

Mounted vertically, it employs an extended surface area 'coil' to minimise secondary vibration modes, this also avoiding the use of a matching transformer. The narrow driver delivers good, wide-angle directivity over the horizontal plane, but is intentionally of significant height to reduce the radiation angle in the vertical or height plane.

Fink sees this as an advantage, suppressing the excitation of floor and ceiling reflections, which otherwise may interfere with timbre and image focus. It also better matches the natural narrowing of the

radiation angle and acoustic output of the bass-mid driver towards the crossover frequency at 2.3kHz. The inherent Heil principle of 'diaphragm pumping' magnifies the coupled air load, so increasing maximum output and efficiency while also reducing distortion and thermal compression.

The designed listening axis is centred on the tweeter, the low, tilted-back stand directing this axis towards the listener's head, and the included spikes just long enough to offer some differential adjustment for listener and chair height.

The tapered lateral profile of the upper section of the enclosure, significantly reducing the baffle width from 300mm to 205 mm local to the tweeter, aids treble directivity: this taper also controls diffraction at the enclosure edge, promoting more uniform frequency responses both on and off axis.

### The Crossover Network

While some designer may strive for crossover simplicity, Karl-Heinz Fink isn't afraid of complexity – provided the chosen electrical components are of high quality. A classic example was the BBC LS 3/5a, the prototype of which couldn't be regarded as anything close to a programme quality monitor until a highly developed complex frequency equalising crossover was developed for it. This late 1970s design used high quality components, including close tolerance plastic film capacitors together with very low-loss, low-distortion air-gapped transformer-type inductors using costly high-nickel Mu-Metal cores.

Mundorf supplies the bulk of the audiophile grade components for the complex two-section KIM crossover network. The alignment for the mid-treble transition is nominally Linkwitz-Riley, 4th order 24dB/octave, but with an additional passive all-pass delay network to the tweeter section to substantially improve the phase integration between the outputs of the low and high frequency units.

This design detail returns a more uniform system phase alignment over wider range of angles, with potential improvements in image focus, image depth and width, and off-axis uniformity. The powerful tweeter allows for a desirably lower than usual crossover frequency of 2.2kHz thus improving the power response, namely the off-axis energy envelope which energises the whole room space. In consequence the room acoustic should sound more uniform and natural than usually found.

All the inductors are zero-distortion, overload-free air-core types, save one low-frequency element. The latter is in any case a powerful soft-iron laminated design, which is found on a side-arm within the

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crossover network. It has a minor secondary role in smoothing the load impedance, which improves matching to valve /tube amplifiers.

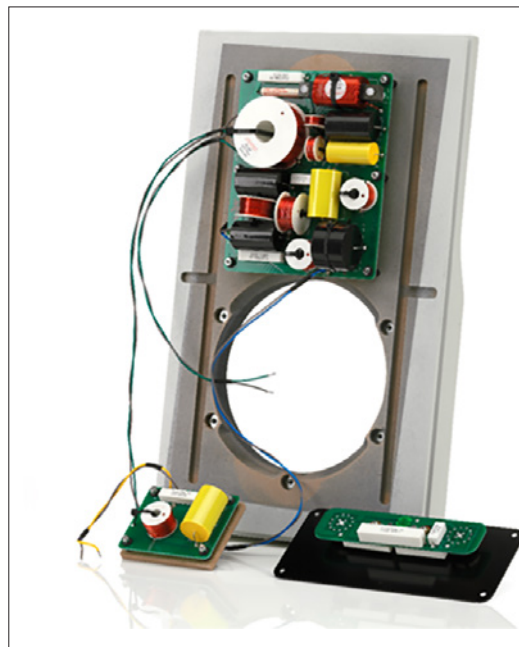
Also included is mild compensation for the typical electrical impedance peak found in the midrange with most loudspeakers, and this tweak is also included to improve matching for valve/ tube amplifiers, thus helping to promote a more consistent timbre. This detail complements the rear panel user adjustments for some quite subtle system tuning/alignments. A three-position 'bass punch' control is provided at lower frequencies, covering 120-300Hz and with an adjustment of

just +/-0.4dB, helping to match a range of amplifier types for the most neutral sound quality. To some degree it also accommodates different lengths and types of loudspeaker cable.

### Almost invisible treble adjustment

There's also a subtle +/-0.2dB control for the overall high frequency level, and I note with interest that another journal reported that this control variation was 'unmeasurably small!'. While confess I did have to turn up the display magnification on my own response measurements to confirm its presence, it *is* there, and there's no question that you can hear

*FinkTeam is one of the few that understands and appreciates good musical timing*



### The Main Crossover

The complete crossover sub-assembly is mounted on the back of the massive high-density composition board driver baffle. The two secondary items seen on flying leads comprise the rear terminal panel (black) with both the low frequency damping and high frequency level adjustment PCB, plus the smaller high frequency section feeding the AMT level adjust for the ribbon tweeter. The tweeter is mounted on the front baffle behind the main crossover, which includes the 2.3mH high-power air-core inductor (white bobbin) feeding the mid/bass driver.

Overall I counted a total of 27 elements in the crossover, not including the two rotary switches: the capacitors are high-quality low-loss polypropylene film devices from by Mundorf.



### The Enclosure

Loudspeaker enclosures are becoming increasingly sophisticated – we've come a long way from a simple box to enclose some air and serve as a platform for the loudspeaker drivers. As in the Borg, KIM employs multiple tuned spatial-mode absorbers inside the enclosure to terminate colouration-inducing standing waves: these are discrete frequency resonances.

In 1999 US patent 9913024 (for Pioneer Corporation), inventors Takashi Mitsuhashi and Hiroyuki Hamada describe an enclosure including a frequency-spaced array of quarter-wave tuned absorbers to help control internal box modes, which would otherwise be energised by the usual rear radiation from a driver. This idea is an earlier, if less complex, solution than the multiple path KEF 'Metamaterials' back wave termination (featured in HIFICRITIC Oct-Dec issue 2020).

One benefit concerns the preservation of the natural adiabatic behaviour of the enclosure 'air-spring', thus imparting minimal delay with the wave termination. Increasing amounts of the more common fibrous stuffing, as used in a simple box, leads to an increasingly isothermal behaviour of the 'air spring', potentially slowing the bass: isothermal operation adds a delay to the recovery from the compression and rarefaction cycles. FinkTeam is one of the few to understand and appreciate good musical timing: its designs endeavour to maintain this quality by minimising the requirement for stuffing.

it, and that it is useful. Purists might care to note these control switches are not directly in the signal path. Ingeniously they are configured as '10%' or so 'bypasses' in parallel with the main path, and hence have much less of a possible deleterious effect than the usual placement of such adjustment and switches directly in the signal line to a driver.

Crossover resistors are even specified as bi-filar or near zero inductance types, thus avoiding frequency dependant colouration and secondarily minimising the potential for electromagnetic coupling to printed circuit track and other components.

**Single-wire terminals**

The terminal panel utilises a set of single-wire pure copper binding posts: quoting Fink, 'It follows the philosophy that one good cable sounds better than two ordinary types, so that better quality cable can be afforded'. I would add that with subsequent later investigation, many bi- and tri-wire speakers will be found to have the rear terminals and jumper strips working loose, undermining the whole idea. The crossover is mounted on the high-density driver baffle, as you can see in the panel opposite.

Having dealt with the internal spatial resonances, FinkTeam also deals in some detail with both structural enclosure panel resonances and not least those spurious acoustical modes often present in a bass reflex vent – a field in which it specialises.

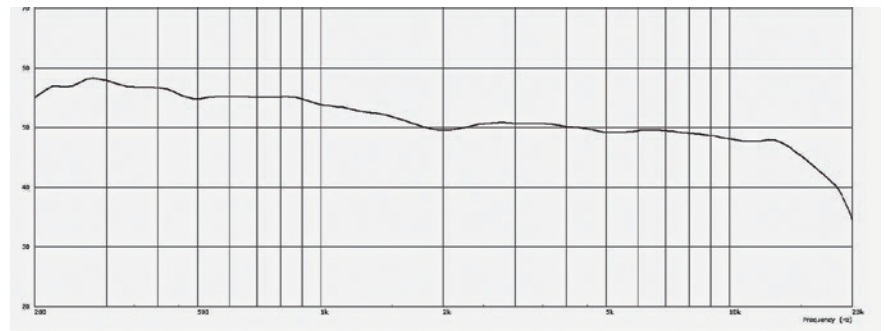
The port design is drawn from that of the Borg, in that the main gas-flowed vent has a second acoustical element along the pipe section: this operates in anti-resonance to the dominant pipe mode, hence largely suppressing it without using lossy damping materials. This helps maintain that characteristic bass 'punch'.

Such detail is part of the comprehensive approach to controlling unwanted colouration by dealing with the more important of the secondary resonances. Gas-flowed, the internally-ducted port exits as a low-turbulence rectangular aperture, measuring 35x100mm and located on the upper section of the enclosure's back panel. The duct/ enclosure volume is tuned to 38 Hz, indicative of an overall in-room frequency response reasonably extending to 33Hz, the port has increasing the low-frequency extension but – perhaps more importantly – almost doubling the power handling of the 200mm driver at low frequencies.

The multilayer MDF enclosure panels are of sandwich construction with a good thickness of the latest energy damping polymer interposed, almost silencing vibration modes. FinkTeam additionally takes advantage of computer modelling to control residual unwanted radiated sound output, using internal bracing at selected strategic locations.

**Factory Lab Data**

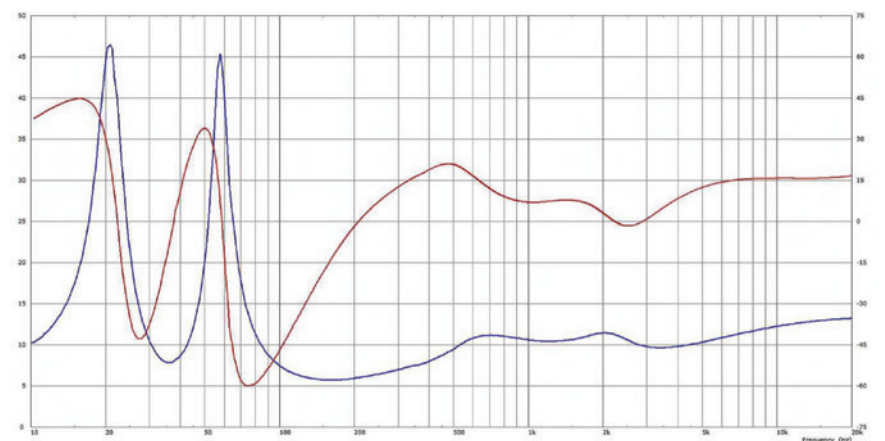
FinkTeam Laboratory supplied some interesting graphical data for KIM – including acoustical power, which is well worth a second look.



**KIM Acoustic Power Response (factory)**

The 'acoustic power' response over frequency, the total output of a design when summed over all angles, is often disfigured by steps or dips in the trace particularly at crossover frequency transitions, typically between different sized drive units. These can contribute to audible colouration in the driven room acoustic and Karl-Heinz Fink sets high importance on addressing this issue.

The factory curve for acoustic power for KIM, here from 200Hz upwards, is shown and it is remarkable for its smooth trend. A desirably gradual down-slope with frequency is shown, with only 10dB of fall from 200Hz to 13kHz, while commonly found colouration inducing 'steps' in output level are notably absent. The custom AMT tweeter also does well on this measure of uniform acoustical power, with an excellently tolerated output: +/- 1.5dB from 1.7kHz to 14kHz.

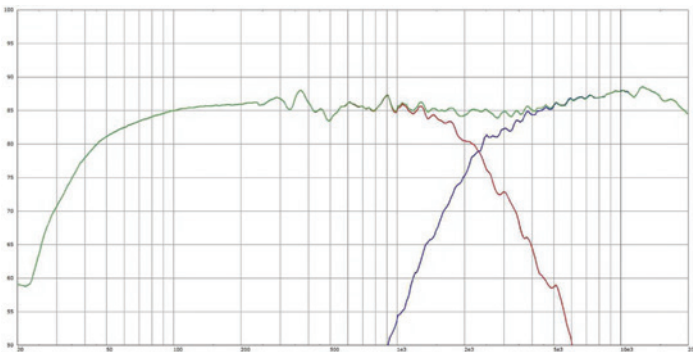


**KIM Amplifier Load: Complex Impedance** (resistance in Blue, phase in Red; for mid settings of the rear panel controls, factory data)

Here the amplifier load curve almost kisses a modest 5.5 ohm resistive minimum and remains nicely uniform to the 20kHz limit, indicating a more consistent than usual matching to cables and amplifiers. The implied nominal load impedance is closer to 8 ohms over the frequency range confirming the kinder than average value, and with it an implied superior loudspeaker efficiency.

Above 150Hz the load phase angle is moderate, while below 80Hz the load averages an easy 20 Ohms. Valve/tube amplifiers and longer speaker cables should get on well with this design. (See HIFICRITIC lab results.)

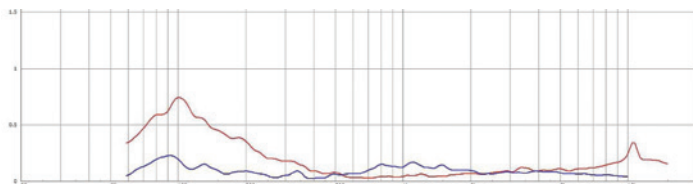
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### KIM Crossover Frequency Responses

System (green) and Drive Units (red, blue) (factory data)

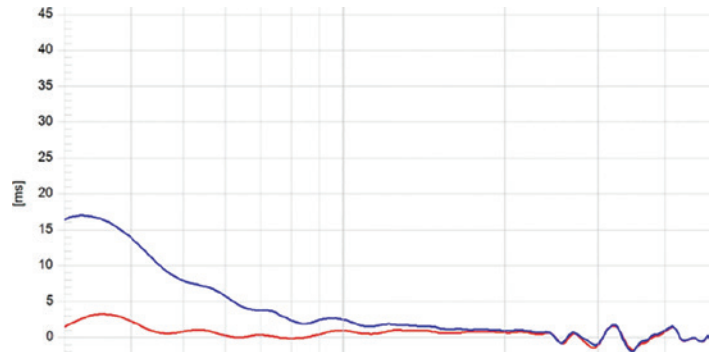
Under laboratory conditions the axial response data from Finkteam shows a near perfect L-R 4<sup>th</sup> order transition between mid and treble at 2.2kHz, -6dB, with correct 24dB/oct slopes, just as they should be, and with a primary summed output (green) held within a close tolerated +, -2dB limits from 80Hz to 22kHz. If this claimed free-field frequency response is obtained in practice we should note the intended, room matched down-slope from 150Hz to 45Hz which should free this loudspeaker from the usual room coupled bass excess and 'boominess'. With typical room gain increasing at lower frequencies this loudspeaker should provide effective low frequency output down to about 38Hz.



### KIM Harmonic Distortion

Second harmonic (blue), third harmonic (red) (factory data)

For a nominal 1W input, 86dB SPL, second harmonic (blue) is claimed averaging a very low 0.1% from 150Hz to 10kHz. There is a narrow blip to 0.35% at about 11kHz which we verified. Third harmonic (red) is similarly low, though it does show an increase to a harmless maximum of 0.8% by 100Hz at lower frequencies. Certainly, it was useful to have sight of these generic distortion results for KIM, to compare these with our own test results.



### Group Delay

(Blue), and with the ROON 'KFH replay filter' implemented (red), this real time delay correction is present in software computed through the inbuilt ROON DSP engine.

Karl-Heinz Fink also supplied the intrinsic group delay performance, showing the result both before (blue) and after correction (red). The red curve shows the result after the relevant processing option available in ROON replay is invoked. The intrinsic 16ms or so of delay is then reduced to a maximum of 4ms while the subsequent stable level settles at about 2ms which brings this moderate error close to inaudibility. (Also see listening tests.)

### Specifications (factory)

Price	£8900/pr (in standard finishes)
Frequency Response	45Hz-23kHz +/-3dB, -10dB limits at 35Hz and 25kHz
Rated Impedance	8 Ohm. Minimum Impedance: 5.9 Ohm @ 160Hz
Sensitivity	86 dB @ 2.83V / 1 m
Distortion	0.2% THD @1W typically
Crossover Frequency	2.2 kHz
Bass-Mid Unit	High-Power 8-inch 200mm pulp composition cone, 38mm 1.5 inch voice coil
HF Unit Radiator	80 mm high by 20 mm wide, (Fink-Mundorf AMT folded ribbon)
Dimensions	854 x 300 x 310 mm (HWD) (Depth 412 mm overall including fitted stand)
Weight	25.1 kg complete with stand
Finishes	Amara Ebony with black front, American Walnut with black or white front White Matt with Steel Grey front Black Matt with Black front Piano finishes and other veneers/colours to special order Stands currently in satin black only

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# HIFICRITIC Lab Report

## Sensitivity and Frequency Responses

Within known experimental error, we measured the axial 1m sensitivity at 85.5dB/2.83V – a little below the industry average, though good for a relatively compact standmount design. The averaged impedance is slightly under 8 ohms, with a nominal minimum reading of 5.5 ohms, and with its really moderate phase angles this low-reactance amplifier load is still much lighter than the industry average, and consequently is kind to amplifiers, terminations and loudspeaker cables. Verifying the manufacturer's claim, it will suit all kinds of tube and solid state amplifiers.

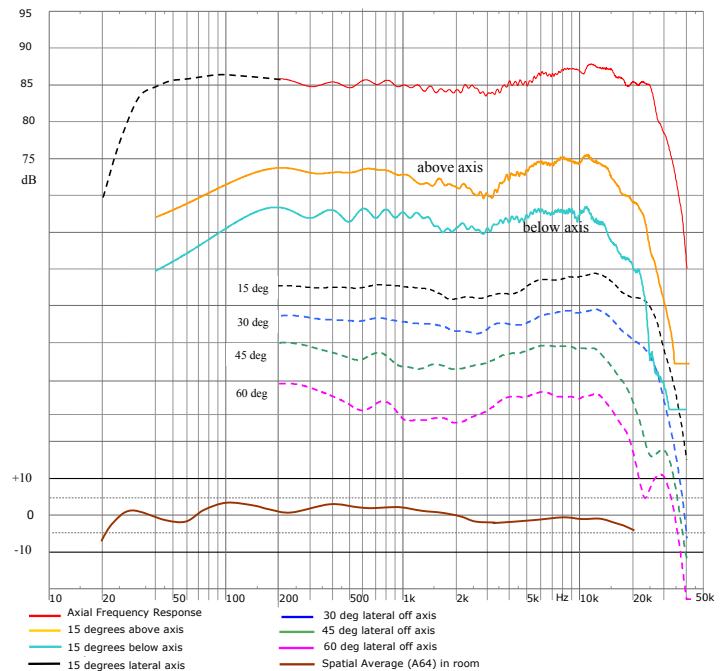
The axial frequency response of that vertically elongated 'slot' treble unit is slightly tailored to 'voice' its timbre, taking account of an off-axis behaviour which differs from the hemispherical output of the usual dome unit. This ribbon driver output is narrower in the vertical plane.

Nevertheless, and without smoothing, the overall axial response meets a highly commendable  $\pm 2$ dB, 40Hz to 24kHz, an unusually wide range. In addition, this consistency over the  $\pm 30$  degree horizontal plane is exceptionally uniform, at  $\pm 2$ dB, 50Hz to 24kHz, while both above and below axis the overall acoustic output still met a close tolerance of  $\pm 3$ dB from 80Hz to 15kHz. This confirms the excellent – near-textbook – crossover behaviour, and the fine integration of the drivers' acoustic outputs. Without the need for measurement smoothing, the raw mid-treble axial output met a mightily impressive  $\pm 1$ dB, 200Hz to 5kHz, a result which will embarrass much of the competition and many microphones. Despite the larger than average bass-mid driver, the sound output remained nicely even and well extended off-axis, this helping to minimise possible colouration from side wall reflections.

The important, 'timbre characterising' 15 degree lateral off-axis results were outstanding: I recorded a very tight  $\pm 2$ dB tolerance right up to 22kHz, and even at 60 degrees off axis, narrow  $\pm 3$ dB limits sufficed out to 16kHz, though that visible and characteristic upper mid 'trough' does increase a little to about 4dB. Even so this aspect is still rather less than is usually found with such a two-way design.

I suspect that this response feature forms part of the voicing, balancing directivity/power response with the perceived perspective. All of the 'on' and 'off' axis results show most capable system design with excellent driver output integration and very good overall response consistency. The in-room spatial average for 64 measurements, for each of the two

Finkteam Kim Frequency Responses (85.5dB sensitivity for 2.83V)



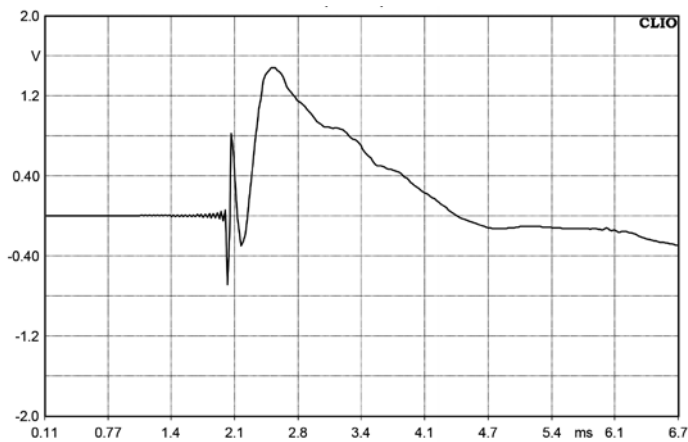
loudspeakers, and for multiple listener locations, confirms this fine behaviour. KIM demonstrates the benefit of a highly controlled acoustic output since the room was really well 'illuminated', delivering another remarkable result: just  $\pm 3$ dB of variation from 35Hz to 15kHz in-room, where it is more usual to find that wider  $\pm 5$ dB limits are required.

## Harmonic Distortion

The low frequency output is rather more powerful and extended than usual for the size, and 33Hz can be delivered to the listening room at useful power and without audible distortion, here tried on an exacting 10W of sinewave power for 96dB/m. While it was certainly near overload for the lower frequency tone at 25Hz, again for 10W of power, the 2<sup>nd</sup> harmonic distortion remained impressively controlled at -17dB, only just audible on sinewave and certainly not with music (thanks to masking psychoacoustics). Additionally, the more audible 3<sup>rd</sup> third harmonic measured better than -22dB, with 4<sup>th</sup> -31dB and 5<sup>th</sup> a low -46dB. This is impressive for a 200mm driver while the now hard working port was not too 'noisy' either.

At the higher frequency of 30Hz harmonics were now better than 30dB down still at this substantial 10W of sine wave. That's quite inaudible on equivalent programme, really loud in the room and subjectively clean. No wonder KIM impresses with cathedral organ: eyes closed it really does sound like a much larger design. At a 1W sine wave input, also

Finkteam Kim Step Response



subjectively pretty loud, a mid-range 500Hz tone revealed really low distortion, better than 0.06% for 2<sup>nd</sup> harmonic and a better still 0.04% for 3<sup>rd</sup>. And at 1.5kHz, an aurally critical region, the all-important third harmonic was an excellently low -72dB, 0.026%.

The bass driver could sustain a massive 30W sinewave short term at a low 38Hz, with an extraordinarily low 3.2% of 2<sup>nd</sup>, 3.4 % 3<sup>rd</sup> harmonic, while those potentially 'whiney' sounding 4th and higher harmonics were less than 0.3% at this substantial power input, again subjectively inaudible despite room shaking sound levels.

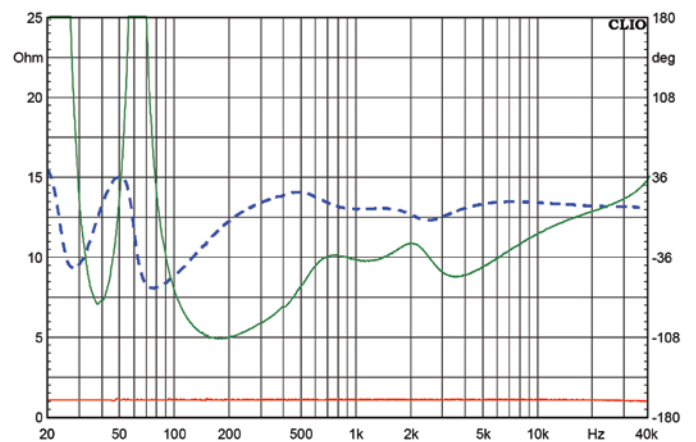
**Low-level linearity**

Some loudspeakers plateau out at a low level of distortion with no further improvement, but not so the KIM, which acts more like a Class A tube device with demonstrably improving linearity at progressively lower sound levels.

Working at a conversational loudness of 70-80dB SPL, here in the midband, second and third harmonics were deemed totally inaudible at -70dB 0.03%, while 4<sup>th</sup> was -76dB, just 0.015%, while all remaining harmonics in the audio band were actually better than 0.010%, or -80dB. These results are better than many amplifiers. And what about that custom AMT high frequency ribbon: could it match this remarkable bass-mid driver?

An ear bleeding one-watt input in the 3.3kHz 'power range' for the tweeter produces an excellent result of just 0.12% of second with 0.027% of third. By 10kHz it remained excellent, with 0.12% of second, 0.035% of third, all these results rated inaudible. Such readings were pretty constant over the working frequency range. I could swear that this low level of distortion, which was also of a musically consonant low order nature, contributed mightily to the fine transparency and low fatigue experienced during the auditioning.

Finkteam Kim Load Impedance (green) and Phase (blue)



**Load Impedance**

Just momentarily kissing the 5 Ohm magnitude impedance line at 180Hz, most of the time KIM averages a kind 9 Ohm loading. Another factor in the amplifier (and cable) matching story is the phase angle of the load. Often we find design compromises where a low impedance combines with a more severe phase angle, particularly at lower frequencies where programme power demands may be high. For KIM the worst case values were the combinations of a mild 65 degrees at 95 Hz with a magnitude of 7.5 Ohms, pretty harmless. The low loss, fast responding bass driver suspension is seen in the naturally high impedance peaks at low frequencies, heading up towards 30 Ohms at 23 Hz and at 65 Hz. The port is classically aligned for optimal room drive at a low 39Hz, confirming the extended bass heard. In summary KIM offers a particularly easy, nominal '8ohm' load.

**Energy Decay Waterfall**

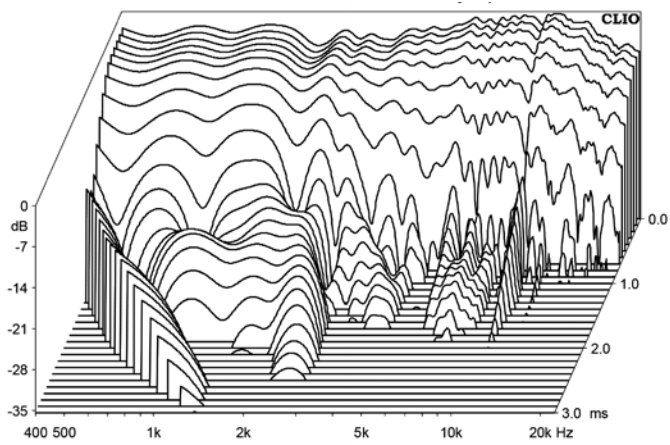
From the waterfall display of energy decay with time, KIM is seen to have a uniform early response, a very fine result indicative of low coloration and good driver phase integration. There is a minor dip in response leading to a low level 'resonance' at 12kHz, unlikely to be audible at the low -20dB level seen here. Overall, the decay spectrum is singularly resonance free. This result verifies much of the low coloration and transparency observed.

**Power Handling**

Used with discretion, KIM was comfortable with undistorted peak programme powers up to 150W. A pair will be capable of impressive in-room sound levels of 104dBA, confirming the substantial dynamic range enjoyed during listening. Thus it is able to drive larger spaces up to 80m<sup>3</sup>, though understandably not to rock concert levels.

## REVIEW

Finkteam Kim Waterfall Decay Spectrum



(**Note:** My early production sample had a minor issue when using cables terminated with 4mm plugs while at the same time not fully tightening the binding posts. I heard a buzz in the lower mid range notes from the unlocked spinners at around 500Hz. Using a B&K accelerometer I identified a significant panel vibration mode at 505Hz on the back near the terminals. FinkTeam confirmed that our review sample was first batch, and explained that this issue had already been noted and fixed, by interposing a small intermediate damping pads to the PCB inside on the terminal plate, which under instruction we were easily able to fix.)

