

# HIFICRITIC

AUDIO REVIEW JOURNAL

Vol1/No3 MAY/JUNE 2007 £8

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## MUSIC & MORE

# Wilson Audio WATT/Puppy System 8

THE WATT/PUPPY TWO-BOX SPEAKER SYSTEM HAS BEEN WILSON AUDIO'S STAPLE FOR TWENTY ODD YEARS. MARTIN COLLOMS SCRUTINISES THE NEW SYSTEM 8 VERSION, WHICH INCORPORATES THE MOST RADICAL REVISIONS TO DATE

MARTIN COLLOMS

Loudspeaker designer David Wilson set a trend back in 1985. By combining his compact two-way *WATT* (Wilson Audio Tiny Tot) with the *Puppy* subwoofer, he more or less defined the global standard for a relatively compact, powerful, full-range domestic loudspeaker. The basic concept was so successful that it has remained fundamentally unchanged since then, even resulting in a listing in the Guinness Book of Records as the largest selling 'high end' speaker of its type in the world.

Built to uncompromising standards that inevitably result in relatively high costs, and making no attempts to get involved in offshore manufacture or sub-contracting, Wilson has been singularly successful in presenting the credentials for this project's design, engineering, build and finish. Much of the high end market has eagerly awaited each successive iteration of the concept over the product's two decades of life.

Once one of the most expensive speakers on the market, it now has many competitors, and even some imitators: some much cheaper, some substantially more expensive. That core two-box *WATT/Puppy* concept has survived all these developments, showing the endurance of a Porsche 911 – another icon for which intense continuing research has carried on bringing performance rewards.

When the fundamentals of a design are largely right, improvements may be attained by attention to small details. An accumulation of small gains then results in significant overall benefits. A parallel may be found in applying good tuning practice to a casually set up audio system, where a series of small changes – contact cleanliness for connectors, cable alignment, equipment spike tightness, clearing the equipment shelves of stray items, for examples – may together provide a substantial lift in sound quality. Such practice can seem much like wizardry to a bystander.

By the same token, a revised approach to the way the acoustic energy from the drivers adds up in the space in front of the speaker may lead to clear subjective improvement, even though standard test results might indicate little technical change. The designer can subtly

shape the impressions of image height, instrumental timbre, soundstage perspective, and also the sense of liveness in the room, by careful consideration of the filter design in conjunction with the natural outputs from the drivers, taking account of their radiation pattern as defined in conjunction with the enclosure size and shape. While technical tests are helpful during development, it is the trained ear which must judge the effects, and balance the intended benefit with other sound quality objectives such as transient definition, dynamics, and timing.

This design evolved into its two-box form through the marriage of an established pyramid-shaped full range nearfield *WATT* monitor loudspeaker with a supporting platform. Initially the latter was just a box, forming a floorstanding tower for the monitor to be placed on top. When the tower acquired a couple of big bass drivers, it was dubbed a *Puppy*, or 'small woofer'. Thus the now familiar two-box three-way system was born.

I first encountered a plain *WATT* at a Chicago CES in the mid-1980s, and marvelled at its clarity, focus and sumptuous image depth. In 1992 its third iteration arrived on my doorstep, together with a *Puppy 1*, and I ended up purchasing this full range combination. I acquired an occasionally interrupted taste for the genre, leading to reviews of the fourth, fifth, sixth and seventh iterations in the series over some 20 years. While *System 6* was for me an intermediate stage, *System 7* showed a real jump in performance, leading to a speaker of the year award in *Hi-Fi News*. *System 7* has lasted for four years, and is only now supplanted by *System 8*, which represents a radical re-engineering of this longstanding concept.

The following review has been carried out under UK conditions and the value judgements relate to UK prices. The latter will hold true for many export markets around the world, while the relative price on the US home market is significantly lower. Whereas the US base price for *System 8* is \$27,900, the equivalent UK price is £22,000 (with some variation for special finishes). Note that this does include specialist installation and tuning to the purchaser's room and drive system.





## Tech Story

### Milestones in 20 years of WATT/Puppy development:

- Small floor spikes upgraded to large height-tunable spiked 'Paws'.
- Lower power 170mm SEAS midrange driver replaced by high power Scan Speak unit with 38mm voice coil and carbon fibre reinforced cone.
- Fibreglass inverted tweeter dome material replaced first by aluminium, then titanium.
- Acoustic back loading for tweeter has been subject to continuous improvement.
- Advanced enclosure and damping materials, some proprietary.
- US and European bass tuning options.
- Damping pad coupling for WATT replaced by azimuth adjustable trio of heavy duty spikes, now with improved machined metal tracks.
- Original Puppy Tail wiring harness to WATT made captive and standardised.
- Foam polyester grilles replaced by slim M material panels with pin fixings.
- Modifications to baffle diffraction absorption feature.
- WilsonGloss piano quality finish, providing custom colours for entire speaker.
- New custom bass drivers.
- Improved isolation of crossover network sections.
- Improved phase and time control over crossover regions.

So great are the revisions, it is not feasible to upgrade to the *System 8* from earlier *WATT/Puppy* versions, as has been possible in the past. Instead, Wilson is offering a guaranteed exchange program to ease acquisition of the new model.

Wilson could have followed the current trend and fitted a wider bandwidth tweeter, but instead further developed their best version of the titanium inverted dome made by Focal. A highly efficient and linear design with exceptional dynamic resolution, Wilson fine tunes the low frequency loading to deliver an exceptional result.

The anti-resonance lead block loading for enclosure walls of the original *WATT* is now outlawed for new production on environmental grounds, so the latest

enclosures feature improved internal bracing and laminated M- and X-series panels. The result is said to be a 'sweeter' sounding enclosure signature. The enclosure volume has been increased for the new higher power handling bass drivers, allowing for a revised and more uniform reflex tuning via the generous milled alloy port offset on the rear panel, and offering still lower distortion and greater headroom.

The very basic system specifications are essentially unchanged: two 220mm/185mm (frame/cone) bass drivers, and a 160mm/150mm (frame/cone) midrange, both types using precision die-cast chassis. The rated sensitivity is a well above average 92dB/Watt, but this is a 4 ohm design with a minimum 3 ohms. The heavy construction results in a total crated shipping weight of 566lbs (257 kg) for the pair, though each speaker itself is a rather less extreme 170lbs (77kg). Input is via a single pair of heavy-duty gold-plated binding posts for spade terminated cables. Hard-wired fusible film resistors provide protection.

### Sound Quality

Although the speaker had originally been well run in, it had also subsequently been warehoused and transported. Prior to location tuning in the room, it was substituted for an Avalon *Eidolon Diamond* and first impressions recorded, to see how these might change after acclimatisation and optimal setup. Although the speakers were of similar size, there were quite significant sound quality differences, but it should also be noted that the new Wilson is only around half the price of the Avalon

While the mid-to-treble balance was similar, the *System 8* showed a mild emphasis of vocal sibilance, together with a little less attack and midband transient edge definition: here the Wilson seemed less clearly defined, perhaps a little too sweet. The image was presented at the correct height, a trademark Wilson characteristic when installation approaches optimum: many speakers are out of kilter here, presenting unstable images which vary with frequency content, and may even change height with source. Focus was very good, and if transparency and image depth did not match the costly Avalon, it was still pretty good by the industry norm. At regular natural sound levels the bass was quite strong, several dB louder than the Avalon, because it was initially delivered with the US bass alignment (of two tuning options available) selected.

With further listening, vocals sounded a little 'detached' from the overall presentation, with a lightening of vocal texture in the lower registers, though this is perhaps a matter of taste. While not erring on the thin or

hard side of balance, voices were perceptibly lightweight; thus bass vocals were crisper, almost spot-lit, but not as full bodied as expected. If some early BBC designs could sound 'chesty', particularly when located on a low stand, the *System 8* errs in the other direction. The mildly full bass region below it therefore sounded a bit separated from the lower voice band, and this might impair the sense of rhythm, as the main bass section can sound slightly detached from the percussion line.

Previous *WATT/Puppy* iterations have at times been somewhat characterful: never enough to invalidate the concept, but sufficient for system and positional tuning to be quite important in the complete alignment, and to make these designs an acquired taste for some listeners. However, as this speaker settled down, I found that it slid unobtrusively into my system, appearing relatively undemanding, cool in temperament and lacking aggression, even to the point of moderate restraint. I recall some difficulties a year or so ago, when installing Wilson's *MAXX-2* which seemed to fight my room and system. The *System 8* could not have been more different. It was so self-effacing that it did not impose its identity on the system, showing an innate and desirable neutrality.

Living with an Avalon *Diamond* creates a critical frame of mind in regard to interaction with the specific components of the audio chain. By comparison the Wilson *System 8* initially sounded disappointing – not that surprising perhaps in view of its much lower price – but gradually its innate strengths began to fill out the perceived listening experience. New combinations of equipment were tried out, positively interacting with one of the strengths of this Wilson speaker, namely its versatility and adjustability. One might argue that this is a sign of weakness, implying that the designer doesn't know how the speaker should really sound. Conversely it can be seen as a wholly realistic view of the problems of matching a high performance design to difficult and unpredictable room characteristics. That such flexibility is built into this speaker design, alongside the custom room installation feature, is in my view amongst its greatest strengths.

Wilson-approved installation comes as part of the package, and the speaker is fully adjustable for azimuth angle, location and low frequency damping, so that superior in-room performance is almost guaranteed. In effect, you get optimised speaker performance once it has been installed. Is the *System 8* good enough to justify this level of care and attention? After living with it for some weeks, I have to say 'yes'.

In this latest *System 8* form, the *WATT/Puppy* manages to sound 50% bigger in the bass, while showing crisper

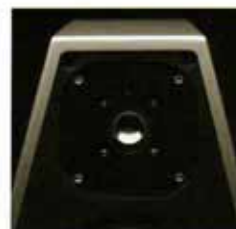
bass percussion, improved tune playing and more low frequency extension. In larger rooms the 'US' alignment will be just fine, while for smaller rooms and those with greater low frequency reverberation, the drier European tuning may be easily set via a programmed resistor adjustment, accessed via a trap door in the base of the speaker.

From an expert viewpoint there is a hint of inherent 'colour' in the tweeter (a tinge of metal foil 'rustle', of the most gentle kind), so cables and sources with a touch of upper high frequency excess or 'edge' are best avoided. However, with the creamy sounding *ARC Reference 3* pre-amp, this 'colour' became unnoticeable, more so than for any Wilson using this type of tweeter that I've heard, save the *X-1* itself.

As the system and the speaker location was optimised, it became clear that while detail wasn't projected at you, the sound was nonetheless highly detailed, and visitors could not help but like its kind-hearted character. It wasn't demanding in a hair shirt, audiophile sort of way: it simply sang its heart out, in an open and strain-free manner, on a broad range of important midband sounds – brass, percussion and not least singing voice.

Despite the potential for self-resonance and coloration from the complex collection of parts, such imperfections seemed to have been swept away in the new design. This speaker majors on sheer listenability, sounding consistently informative, focused and fatigue free. Distortion was subjectively very low, reminding us of the *Quad 2805* electrostatic, and it was gratifying to find this confirmed in the lab tests. Capable of playing at really high sound levels without compression or hardness, full orchestra was no problem at all, nor was full blooded rock material. At the same time they cope with some of the most delicate nuances in jazz, for example on fine ECM recordings (try the excellent sampler 'Spectrum Vol 1' 831-623-2 with 13 tracks from Charlie Hayden to Terje Rypdal with Jarrett and Metheny along the way.) The lead track from Oregon, *The Rapids* was impressively atmospheric and spacious, with excellent differentiation of the complex high frequency percussion, attesting to the purity and dynamics of this version of Focal's titanium tweeter.

The new claim for seamless mid-to-treble transition was easily verifiable: these two drivers sounded just like one. Focus and transparency were very good, and once the location and low frequency adjustment had been optimised, the timing picked up well and the involvement factor with it. Resolution is high, and while dynamics are not thrown at you, on the whole they seem natural and expressive. Image depth was also very good,



*"It wasn't demanding in a hair shirt, audiophile sort of way: it simply sang its heart out, in an open and strain-free manner"*

**Reference Components**

**Sources:** Naim CDS-3, Marantz CD7 CD players; Linn LP12 Naim ARO Koetsu RSII vinyl replay

**Pre-amplifiers:**

ARC Reference 3, Conrad Johnson CT5, ACT 2, Krell 402.

**Power Amplifiers:**

ARC Reference 110, cj 3505A, Krell 402.

**Loudspeakers:**

Wilson Audio System 7, Sonus Faber Stradivari Homage and Amati Anniversario, Peak Consult Zoltan, B&W 800D, Avalon Eidolon Diamond, Wilson MAXX-2, Quad ESL 2805, Krell Resolution One.

delivering orchestral material on a grand scale, while neutrality was sufficiently good to handle all kinds of music with equanimity.

It's interesting to compare the *System 8* with the competition – though those outside the UK should bear in mind local price differentials. Compared to Peak Consult's silky sounding, politely restrained *Zoltan*, the *System 8* goes louder with significantly greater dynamic range, and sounds more open and less rhythmically fettered. It behaves like a much larger and more powerful speaker.

Compared with the B&W *800D* – a significantly less expensive model in Europe – the B&W has a little more impactful 'grunt' in the bass but does not time quite so well. That sophisticated Kevlar midrange sounds very pure, but is perhaps less dynamically engaging than the carbon paper cone of the Wilson. The latter is also more open and detailed through the mid-to-treble transition.

Overall the *System 8* is closer to Sonus Faber's *Stradivari* than the *Amati*. The *Stradivari* is a bit more coloured and 'cluttered' than the Wilson, lacking the exceptional perspectives of the new 8, but it still has an engaging quality of pulse and musical connection with high levels of clarity and detail, performing beyond expectations of price and size.

I recall in my earlier review of the Wilson *System 7*, that I preferred it to the *MAXX 1*. I feel very much the same about the *MAXX 2* and the *System 8*: the latter sounds more coherent, smoother and better integrated.

Overall the *System 8* proved quietly seductive, and nicely responsive to the system from, and the source material with which it is fed. It worked very well with a richer and broader spread of music genres than is usually

encountered, readily revealing subtle differences between good quality cables, and offering impressive transparency with substantial and coherent image depth.

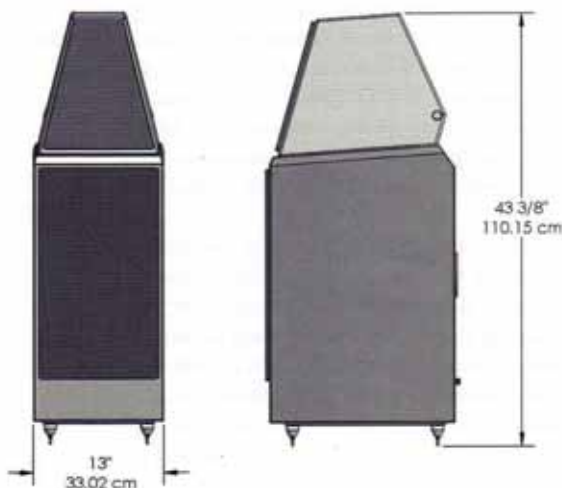
**Lab report**

With the loudspeaker properly adjusted for listener distance and tilt, the reference sensitivity of the *System 8* was precisely on spec, at a usefully high 92dB/8 ohm watt. However, that needs qualifying in respect of impedance, as this speaker is rated at 4 ohms. I found an average amplifier loading of 5 ohms from 100Hz to 30kHz, with a single, very low absolute minimum of 2.3 ohms at 80Hz. It would be better if such low values were avoided, especially for high power designs such as this, due to the high current loading imposed on the connecting cables, contacts and not least, the power amplifier. But it's also true that many competitors impose similarly heavy loadings in their ambition to claim high sensitivities.

With a verified 500W peak programme power capacity (8 ohm rated), maximum music demand at 80Hz will draw up to 40 amps peak current, which the driving amplifier must be capable of delivering to achieve maximum volume without clipping or current limiting. However, in practice this is rather unlikely, as with such a high sensitivity an input of even 160W will produce a loud 109dBA for a pair in a typical room; 500W, an ear-splitting theoretical 114dB. The 160W peak programme input draws a more reasonable 17 amps peak, though this is still rather tough for most valve amplifiers.

Both *WATT & Puppy* enclosures are tuned to similarly low frequencies: 40Hz for the *WATT* (with some residual output) and 30Hz for the *Puppy*. While the *Puppy's* low frequency output tapers gently down towards this port frequency, some room-loaded bass power will still be present to about half an octave lower, ie to around 23Hz. Indeed, when measured alone, that big *Puppy* port has an intrinsic band-pass of +/- 2dB from 60 Hz to 19Hz, thanks to the offset 'low Q' alignment. While the system as a whole measured approximately -6dB at 25Hz, with the bass output reaching a gentle maximum at around 80Hz (the impedance minimum), in practice room gain extends the power response to 25Hz.

When testing for distortion, it was easy to generate clean, high levels down to 35Hz (105dB spl) – classy discrete subwoofer performance by any standards! The new bass drivers are powerful and precise: for example, 40Hz at a high 102dB only raised 1.5% of second harmonic and just 0.2% of third – remarkable figures. At 82dB spl, second was just fine at 0.5%, and third 0.3%, both effectively inaudible for such a low frequency.



Checks at 300Hz, the 'power' mid-band, showed a 'split' second harmonic at 90dB and above, though the result was still more than satisfactory at 0.3%, with negligible third harmonic. The linearity at 300Hz actually increased with power, indicating some dynamic adjustment, and at 102dB spl showed an excellent -55dB (0.16%) of second and -65dB (0.06%) of third. In fact, for much of the range third harmonic was negligible: for example, 92dB spl at 1kHz gave just 0.05% of third, and for 4kHz, an amazing result of less than 0.03% for 102dB spl. By 102dB the midrange driver was working quite hard, and second harmonic was reaching the audibility threshold at -36dB (1.5%), but at normal listening levels (82dB spl) was typically a fine 0.15%. The tweeter is simply excellent: for a loud 92dB spl at 4kHz it showed just 0.07% of second and better than 0.03% of third, and these results are typical across the range.

These are first class results, and together define this loudspeaker's impressive ability to play tough and deliver a stable clear sound over a very wide dynamic range. Low third harmonic distortion means a consistently sweet 'timbre' with no false 'dynamic' hardness in the upper midrange.

Wilson stresses the importance of crossover region time coherence in the new model, and this should be revealed in the consistency of blending driver output over a range of axes and distances, as well as the quality of the waterfall decay responses. I computed the forward 'power average' for the 'axial', 'listener', '30 degrees', '45 degree' and '15 degrees below' axis responses. I found an impressively narrow +/-2dB (1/3-octave weighted) tolerance from 300Hz to 10kHz, and it was within +/- 2.5dB right out to 23kHz. This speaker is certainly well blended in the forward projected solid angle, resulting in a more neutral room reverberation and a stable sound quality and focus over the auditioning zone, confirming the listening results.

The new tweeter has a distinctly moderated high treble peak at 19.2kHz, now reduced to +6dB (directly on the tweeter axis). When the *System 8* is correctly aligned, this is likely to be inaudible except to some wives and children, and even so, is unlikely to be an irritation. This tweeter is well damped in the new design, and the resonance shows little effect on the waterfall analysis of the energy decay.

Examining the transient weighted waterfall, the result in the mid and treble ranges was outstanding for its time coherence, for the large region of early 'white space', and for its rapid early decay, confirming the quick, clean transients identified during the auditioning. The second frequency or 'coloration-related' waterfall,



a representation of energy decay extending to 20kHz, showed the 19.2kHz tweeter peak to be relatively harmless. There was also very little frequency localised clutter in the rest of the analysed range, confirming the low coloration.

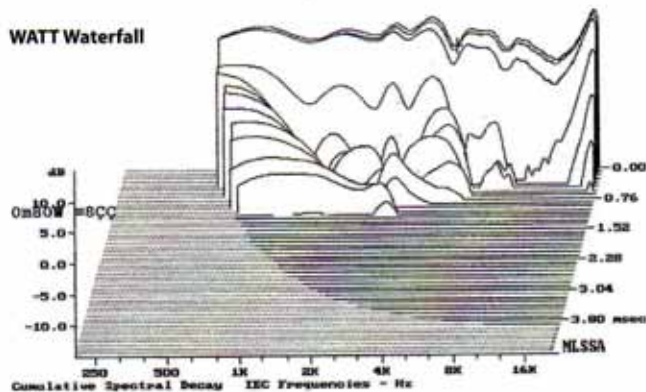
On the ideal listening axis (not straight onto the *WATT*), the review model delivered an impressively uniform reference frequency response +/-2.5dB 30Hz to 21kHz. While I could not take these speakers to an anechoic chamber for absolute measurement, my calibrated in-room results suggest that there is a trend response where the mid-bass is a dB or two prominent, while the lower mid is depressed by a similar amount.

Assessing the spatial energy curve resulting from a total of 64 microphone measurements for left and right hand speakers over the listening region, the mid-bass prominence charted more strongly than we actually heard. The lower mid depression was certainly audible on voices, but not considered too damaging. Overall the *System 8* achieved a creditable 22Hz to 8kHz bandwidth for the spatial test, with no upper crossover transition evident, the whole contained within +/- 3.5dB limits, including room effects. Above 8kHz, the correct, gentle roll-off to inaudibility is apparent, a natural feature of a well behaved 25mm inverted piston dome tweeter.

While fine sound quality is obtained with the carefully designed grilles in place, in a top class installation it simply sounds better with the grilles removed. Front-

**CONTACT**  
 Manufacturer:  
[www.wilsonaudio.com](http://www.wilsonaudio.com)  
 UK Distribution:  
[www.absolutesounds.com](http://www.absolutesounds.com)  
 Tel: 0208 971 3909

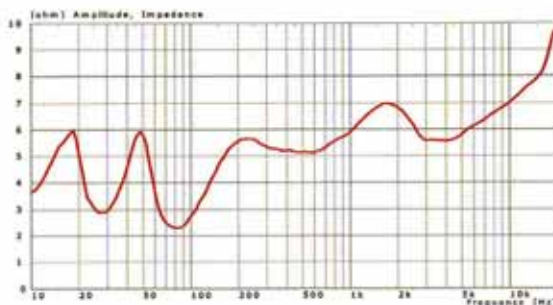
**PRICE** £22,000/pair



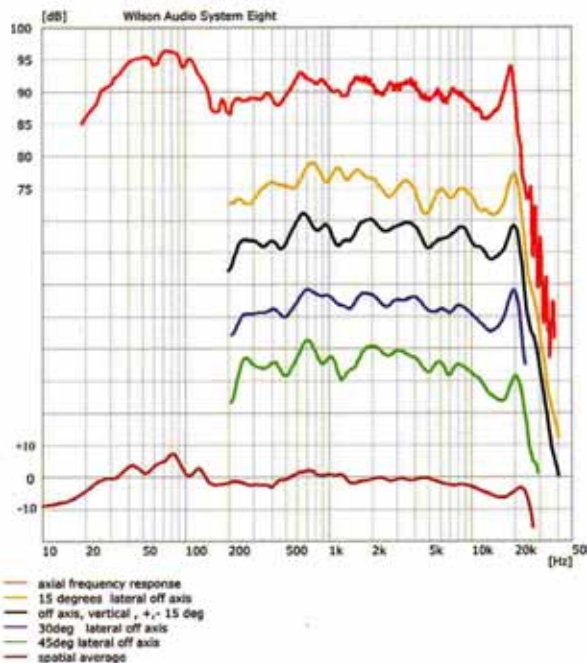
4.00 dB, 5140 Hz (100), 0.000 msec (1)

Matt 8 transient waterfall

**Impedance**



**Frequency Responses**



axial frequency response  
 15 degrees lateral off axis  
 off axis, vertical, +/- 15 deg  
 30deg lateral off axis  
 45deg lateral off axis  
 spatial average

to-back transparency and rhythmic expression are both enhanced, while micro dynamics are better resolved. The measured acoustic performance of the grilles is good, with just 0.7dB of treble loss due to the cloth, and a minor reflection from the thin grille baffle. I think the bulk of the improvement from their removal is a vibration issue, with the inertial mass of the grilles coupled to the enclosure via their elastic mountings.

**Conclusions**

The tests show a very low distortion system, with an extended low frequency bandwidth for its size, excellent power handling including the bass, and a very coherent and neutral midrange, leading to a well blended, ultra low distortion treble. Enclosure coloration is very low, confirming the success of the newly ROHS compliant *WATT* enclosure design. Like the competition it is technically a difficult load, though the *ARC Reference 110* valve power amp did remarkably well with it, aided no doubt by the high sensitivity of the loudspeaker. The power amp and speaker were certainly compatible.

While not a rhythm star in the UK idiom, the *System 8* is more time coherent and upbeat than most of its competition. If a trace of mid cone type coloration remains, it is well disguised by the remarkably coherent blending of the mid and treble registers, and generally passes unnoticed. The speaker proved easy on the ears over long listening sessions.

Smooth almost to point of being laid back, it seduces the ear with its very low distortion, excellent perspectives and stable deep imaging. It is easy to get on with, yet has rewarding levels of detail, and one of the best treble sounds in the business. It's hard not to like this loudspeaker: it makes friends with your system, the music and room, to a remarkable degree. As such, recommendation is assured.

**MANUFACTURER'S SPECIFICATIONS**

Nominal Impedance	4 ohms
Woofers	2x 8 inch
Midrange	1x 7 inch
Tweeter	1x 1 inch Inverted Titanium Dome
Sensitivity	92 dB @ 1 watt (2.0V at 1m)
Minimum Amplifier Power	7 Watts/channel
Frequency Response	+0/-3dB 21Hz-22.5kHz
Dimensions (WxHxD)	13x41x18.75 ins
Weight (each)	170 lbs
Shipping Weight (complete system)	566 lbs