

Olson Speakers LS3/5 Ceramic

TECHNICAL SPECIFICATIONS

Frequency Response

65Hz to 18.5kHz, +/- 2.5dB

Sensitivity

83.5 dB 2.83V @ 1 meter on the tweeter axis.

Input Impedance

6 ohms (nominal)

HF Transducers

One 1" ceramic coated aluminum dome tweeter Visaton of Germany

LF Transducers

One 5" ceramic coated aluminum cone woofer SB Acoustics of Denmark

Rated Power Handling

50 watts IEC

Dimensions (Each)

H 12.0" x W 7.5" x D 6.25"

(H 307mm x W 192mm x D 165mm)

System Weight (per side)

14 lbs (6.35 kg)

Finish

Lacquered Walnut Veneer

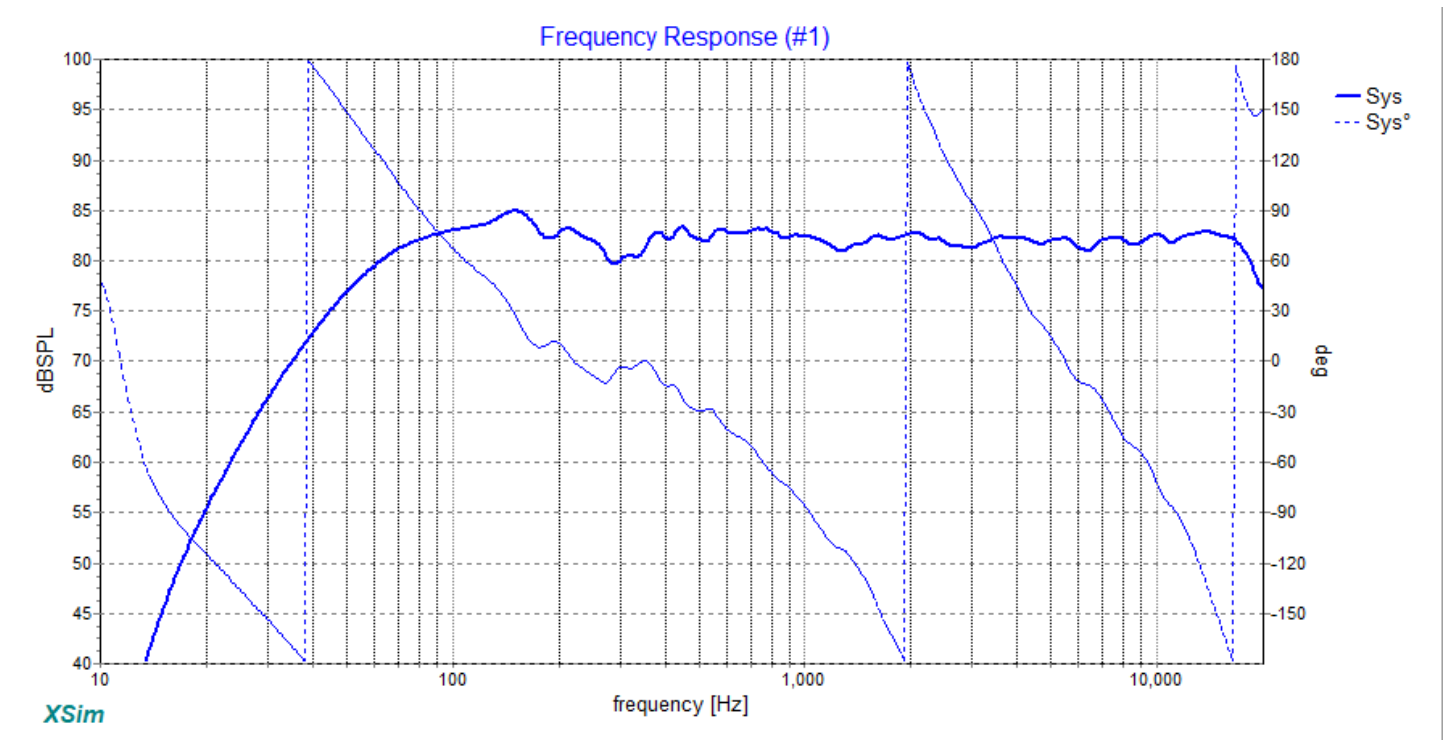


Figure 1: Sound pressure level vs. Frequency. Measured at 18", SPL level adjusted to approximate that for 1 meter at 2.83V. Grill off.
 Olson Speakers LS3/5 Ceramic, a product of Olson Systems, Kirkland, WA
www.olsonspeakers.com

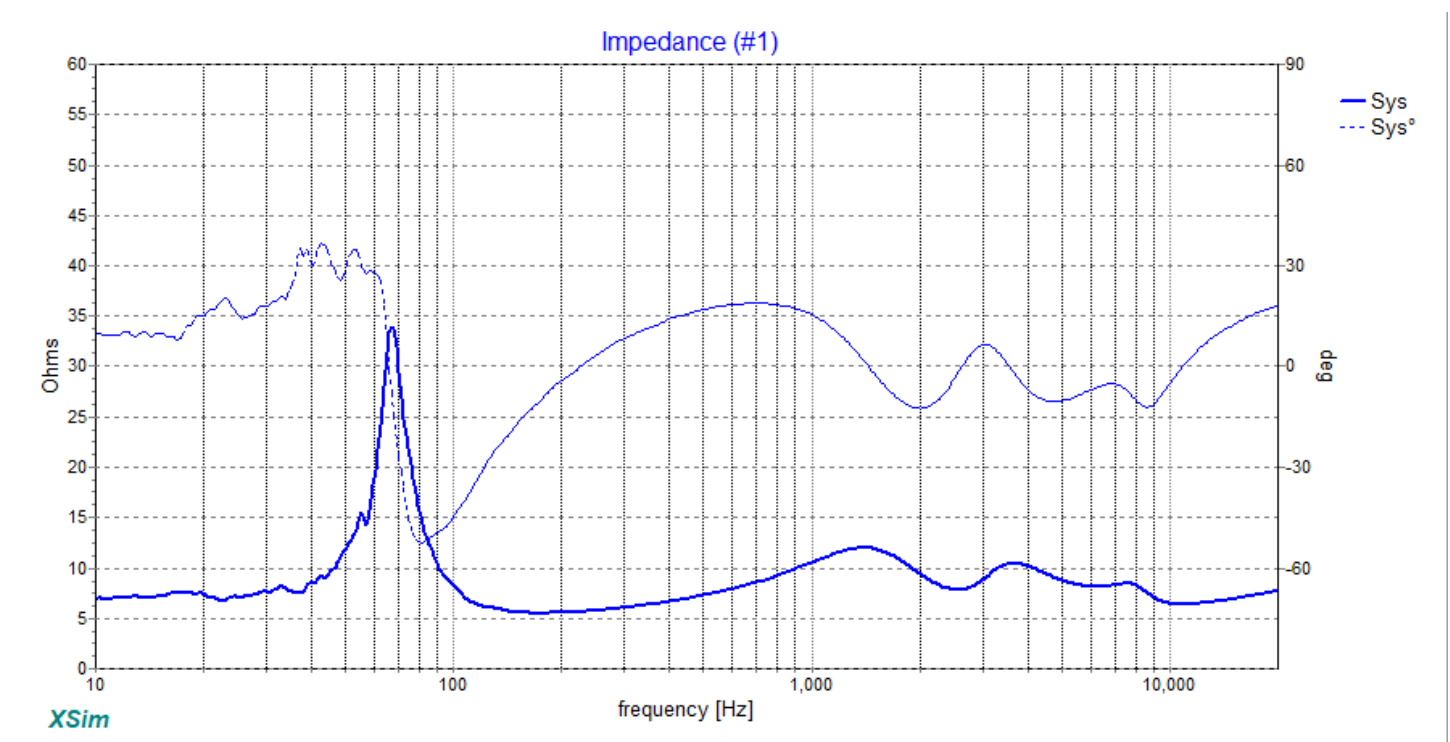
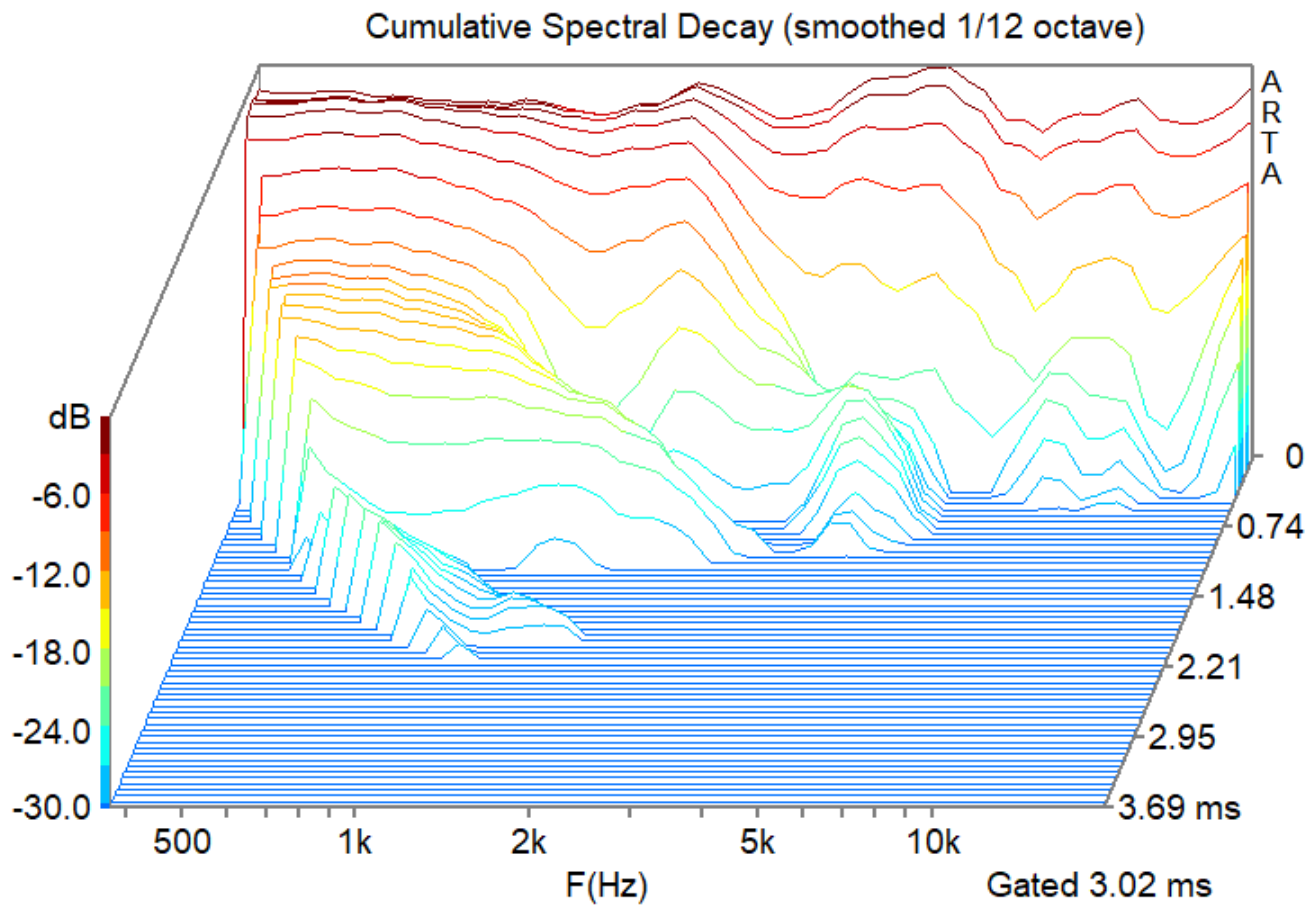


Figure 2: System impedance and impedance phase angle vs. Frequency



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256 pt FFT Cumulative Spectral Decay, Mic at 18 inches

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Figure 3: Rapid decay of an impulse shows no system resonances. (Grill Off)

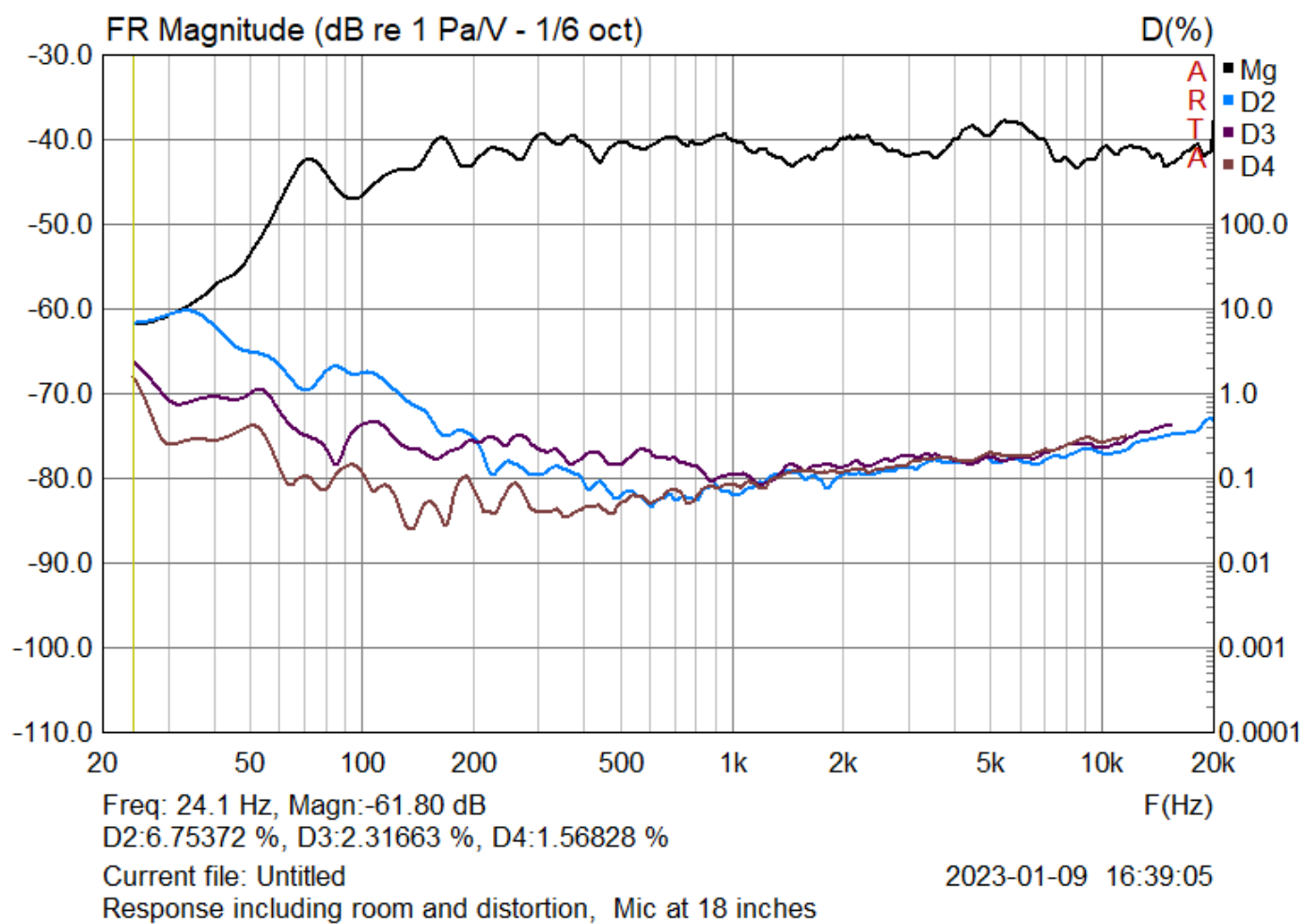


Figure 4: Black Line: Ungated frequency response (SPL not calibrated) Blue: 2nd Harmonic distortion

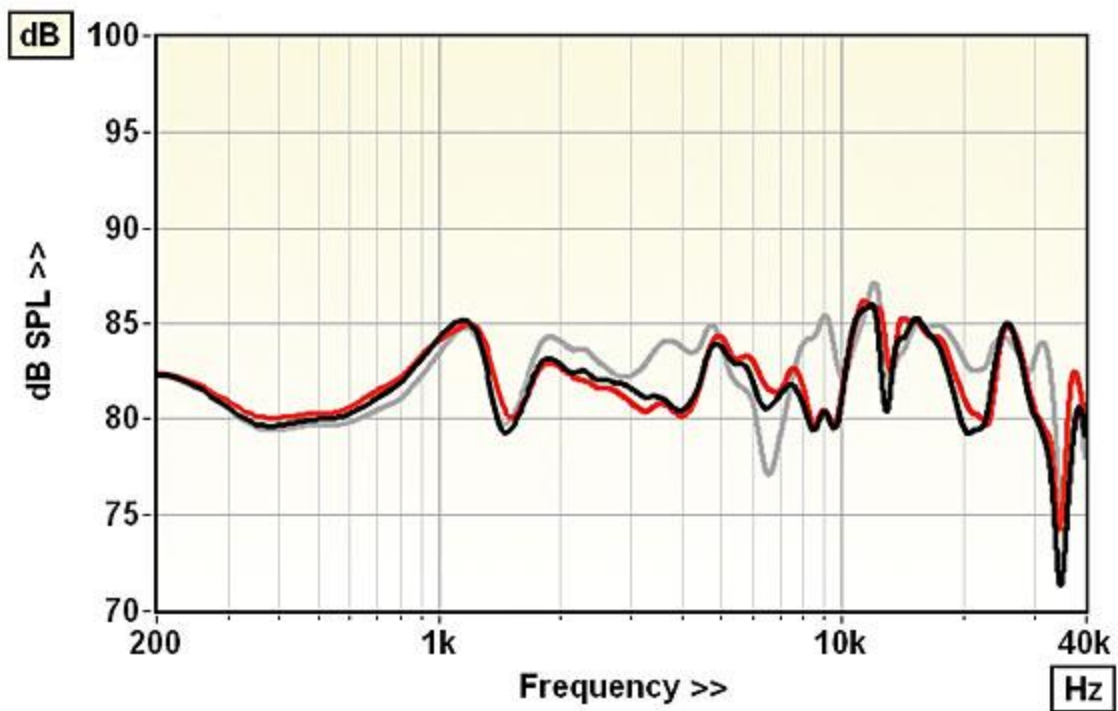
PROVIDED FOR COMPARISON PURPOSES:

Review of the Rogers LS3/5a original BBC design - reproduced from hifi-news.com

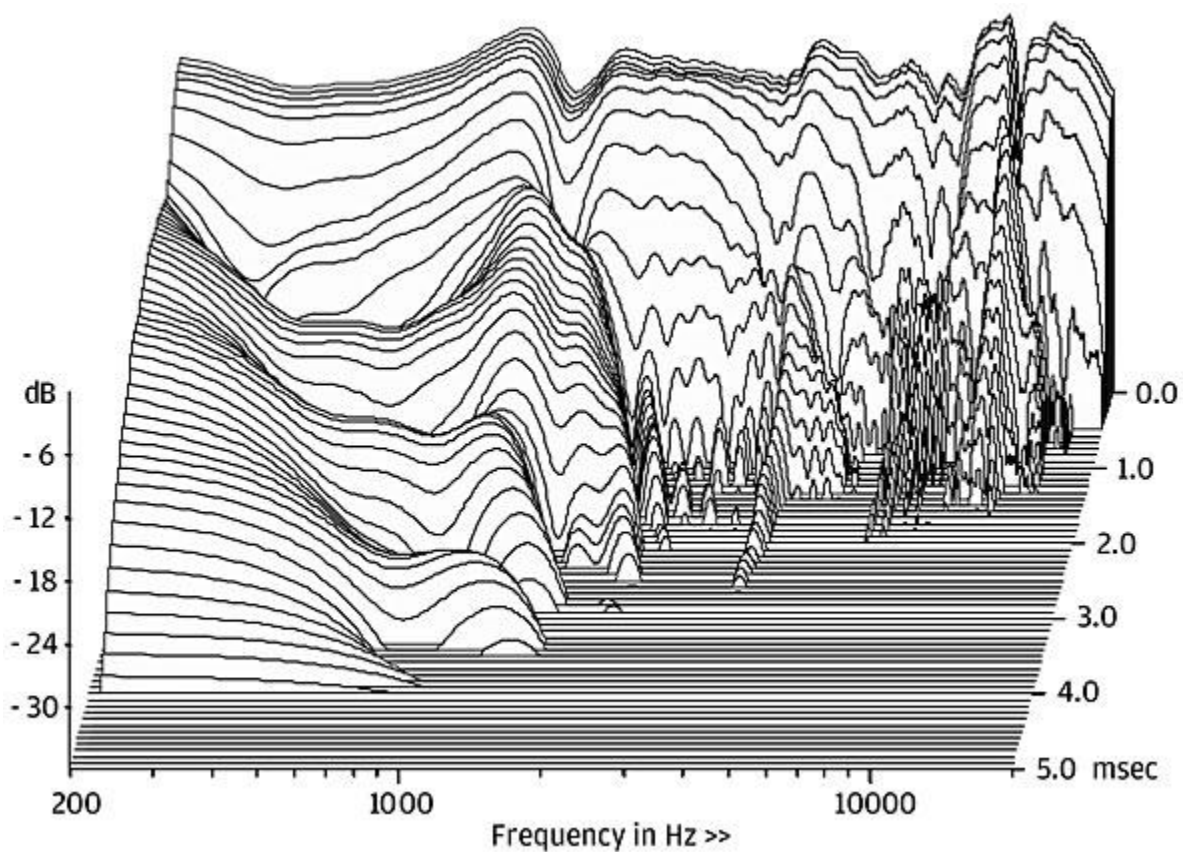
<https://www.hifinews.com/content/rogers-ls35a-classic-loudspeaker-lab-report>

Rogers is unusual in quoting the sensitivity of its Classic to 0.5dB – but when a speaker is this insensitive, every half dB counts. The specification says 82.5dB SPL for 2.83V at 1m and our measured pink noise figure is reassuringly close at 82.3dB. This low figure is due in significant part to the high 15 ohm nominal impedance. Although that doesn't quite square with our measured minimum of 7.9 ohm, the Classic is unquestionably a high-impedance loudspeaker by today's standards. While this hurts its sensitivity, it makes the Classic easy to drive. Despite quite large low frequency impedance phase angles, the high modulus ensures that the EPDR (equivalent peak dissipation resistance) never falls below 4.2ohm/128Hz. There's a second dip to 4.3ohm/46Hz but no worthy amplifier will struggle driving this speaker.

The forward responses [Graph 1, below] were measured at 1m on the tweeter axis with the grille in place [red/black traces] as this should minimise reflection effects from the raised edge of the inset baffle. The notch at 6.5kHz is exaggerated once the grille is removed [grey trace]. The overall trend is flat and, while there are many undulations, errors are modest at ± 3.4 dB and ± 3.3 dB. Pair matching error over the same 200Hz-20kHz span is high at ± 2.2 dB but this is caused by a very narrow-band disparity at about 13kHz. Ignoring that, the matching error reduces to a fair ± 1.2 dB. Diffraction-corrected nearfield bass measurement shows a rising output as frequency falls to 145Hz, before the expected 2nd-order roll-off kicks-in below 100Hz. Bass extension is limited to 73Hz (–6dB re. 200Hz) but boundary gain can be exploited to improve the effective bass extension. The CSD waterfall [Graph 2, below] shows some treble resonances. **KH**



Resp. is essentially flat despite undulations. Removing the grille brings a notch in presence [grey]



Small cabinet is almost necessarily well-damped while driver modes are limited to the treble

Sensitivity (SPL/1m/2.83Vrms – Mean/IEC/Music)	83.1dB/82.3dB/82.2dB
Impedance modulus min/max (20Hz–20kHz)	7.9ohm @ 20Hz, 68.9ohm @ 90Hz
Impedance phase min/max (20Hz–20kHz)	–55° @ 104Hz, 52° @ 76Hz
Pair matching/Response Error (200Hz–20kHz)	±2.2dB/ ±3.4dB/±3.3dB
LF/HF extension (–6dB ref 200Hz/10kHz)	73Hz / 33.4kHz/>40kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	1.7% / 0.5% / 0.9%
Dimensions (HWD) / Weight (Each)	305x190x165mm/5.4kg
Price	£2750-£2799

BBC LS3/5a loudspeaker 1989 Measurements



Sidebar 2: 1989 Measurements

I estimated the voltage sensitivity (using 1/3-octave pink noise centered on 1kHz) and measured the change of impedance with frequency, while the nearfield low-frequency response of each speaker was assessed with a sinewave sweep to get an idea of the true bass extension relative to the level at 100Hz. The frequency response of each speaker in the listening area was measured using pink noise and an Audio Control SA-3050A 1/3-octave spectrum analyzer. Nine sets of six averaged measurements were taken independently for left and right loudspeakers at a distance of just over 2m in a window 72" wide and varying from 27" to 45" high.

The response shown in the review is the average of these measurements, weighted slightly toward the sound heard at the listening position. This spatial averaging is intended to minimize the effect of low-frequency room standing-wave problems on the measurement, and gives a response curve that has proved to correlate reasonably well with what is perceived; it also gives an idea of the off-axis behavior of the speaker under test.

All measurements were performed on my own 11-year-old pair of Rogers LS3/5as, the new samples not arriving in time. The high nature of the original LS3/5a's impedance can be seen from the appropriate graph (fig.1). Dropping below 12 ohms only in the upper bass and the high treble, the LS3/5a's demands for current are few, while the complex

nature of the crossover can be seen in the many-peaked nature of the treble. The new version is said to feature a characteristic 11-ohm impedance, which will make it slightly easier to drive. The sealed box is tuned to a high 93Hz.

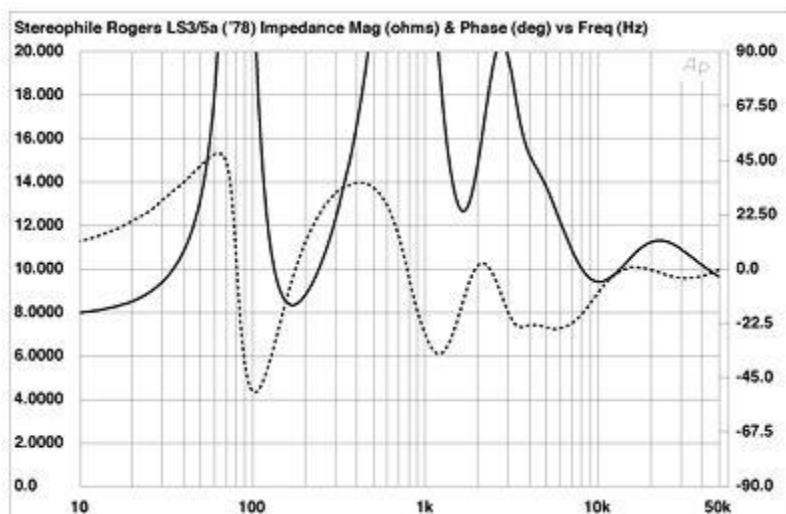


Fig.1 Rogers LS3/5a, 1978 sample, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.).

The measured voltage sensitivity was very low, at a fraction over 82dB/W/m.

Low-powered amplifiers will not drive the speaker to very high levels, yet the limited dynamic headroom means that high-powered amplifiers are to be avoided—a paradoxical design indeed (footnote 1).

In-room, the spatially averaged response (fig.2) holds few surprises: a lumpy upper bass, with no low bass to speak of; a basically smooth curve, tilted up in the top two octaves; the exact "subjective" curve, in fact, drawn back in 1976 by J. Gordon Holt on p.6 of *Stereophile* Vol.3 No.12. Measured in the woofer's nearfield, the -6dB point was a high 68Hz, the room reinforcing this only slightly to just above 50Hz. The degree of upper-bass boom means that the '3/5a must not be placed near the rear wall in an attempt to add bass weight. The result will be thick and muddy.

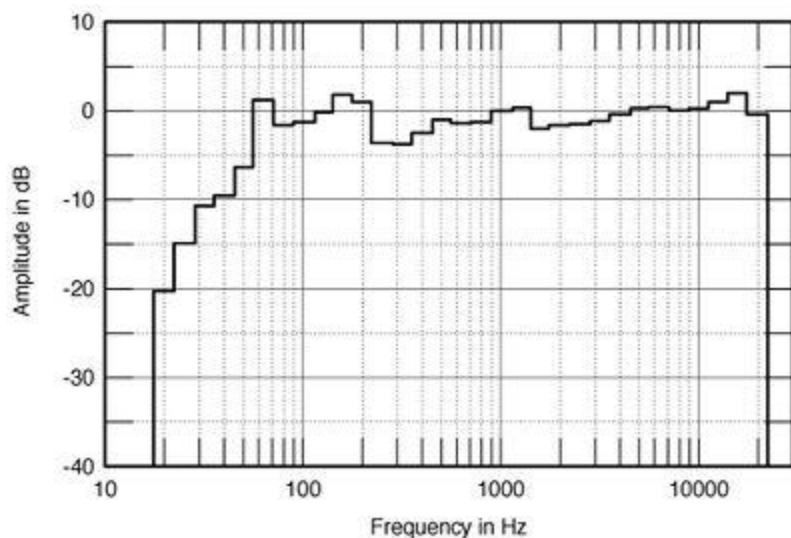


Fig.2 Rogers LS3/5a, 1978 sample, spatially averaged, 1/3-octave response in JA's room.

The slight peak in the 1000-1250Hz region seems to be a consistent feature of the design, but according to Martin Colloms can vary in its height. Modern production is said to be well-behaved in this respect. As is to be expected from a "monitor" design, the pair matching was superb from 200Hz upwards, even when measured at a 2m distance in the listening room. Regarding the rigidity of the enclosure, the LS3/5a was like a rock compared with the other speakers in this report, there only being noticeable sidewall vibration in the 260-360Hz region, and this minor.—**John Atkinson**

[Postscript: In 1994 I examined the horizontal dispersion of the 1978 samples of the Rogers LS3/5a in a full 360-degree circle. This is shown in fig.3, which didn't appear in the 1989 review, of course. I reexamined the same speaker's on-axis response in 2000. This is shown in fig.4, with the associated waterfall plot shown in fig.5.—**John Atkinson**]

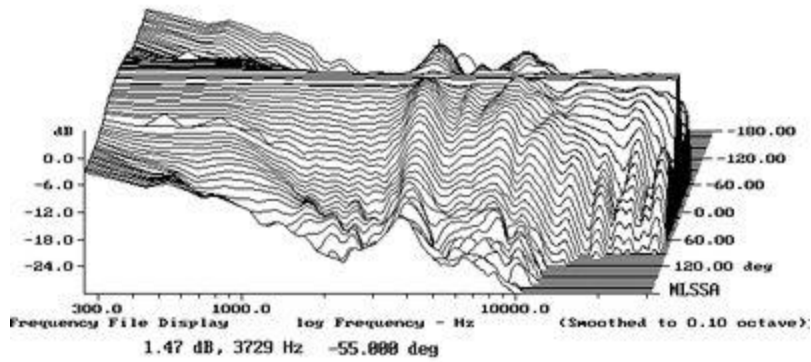


Fig.3 Rogers LS3/5a, 1978 sample, horizontal response family at 50", normalized to response on tweeter axis, from back to front: differences in response 180 degrees-5 degrees off-axis; reference response; differences in response 5 degrees-180 degrees off-axis.

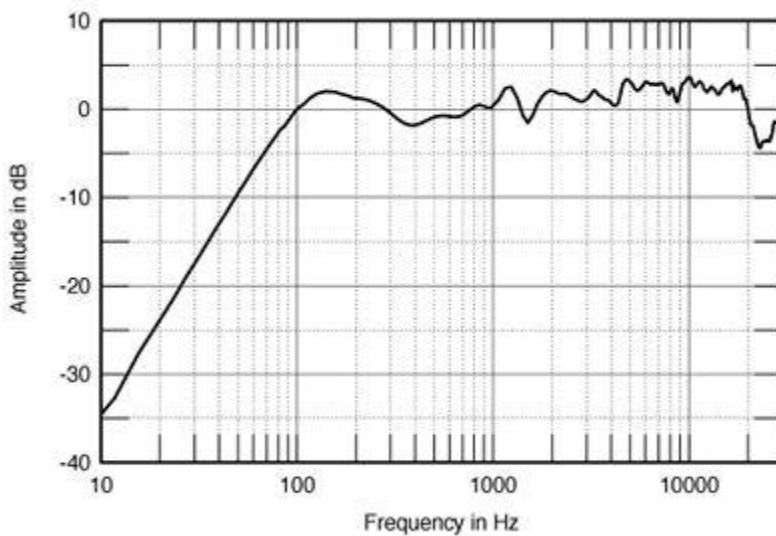


Fig.4 Rogers LS3/5a, 1978 sample, anechoic response on tweeter axis at 50", averaged across 30 degrees horizontal window and corrected for microphone response, with nearfield woofer response plotted below 300Hz.

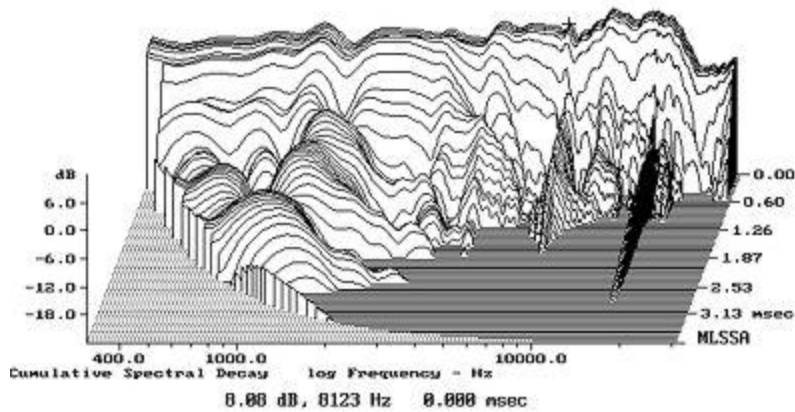


Fig.5 Rogers LS3/5a, cumulative spectral-decay plot at 50" (0.15ms risetime).

Footnote 1: Remember, however, that the 16-ohm impedance of the LS3/5a will mean that amplifiers used with it will have to be downrated. An amp nominally rated at 100W into 8 ohms will only deliver 50W into the LS3/5a before voltage clipping sets in, though it will depend on frequency whether this will occur before the '3/5a's woofer bangs against the end stops.