

KEF LSX

Clearly inspired by its LS50W, KEF's tiny 'wireless' system in a box is a big triumph
Review: **James Parker** Lab: **Keith Howard**

There are active speakers and *active* speakers. Some models claim to be 'active' but are really just powered, with a single amplifier within the speaker cabinet driving the tweeter and mid/bass unit via a conventional passive crossover, sometimes even with a stereo power amp in one speaker driving both it and a slave partner.

True active speakers have their crossovers upstream of the amplification, with separate amp channels dedicated to each drive unit, and only carrying the frequency range appropriate to that driver. Then there are what one might consider 'hyper-active' speakers, with built-in ADCs and DACs, a range of inputs and even wireless music streaming, whether from a network source or online services, or straight from a phone, tablet or computer using Bluetooth or something similar.

NEAT AND COMPLETE

And that describes the KEF LSX, available in a range of colours and selling for £999. It's a complete hi-fi system crammed into a pair of extremely compact speakers. But the existence of the LSX should come as no surprise, for it's a development of the EISA Award-winning £1999 LS50 Wireless loudspeaker system [*HFN* Oct '17], itself based on the LS50 model [*HFN* Jul '12] launched as part of the company's 50th anniversary celebrations, and still a highly popular choice at around the £800 mark.

All three models have a common look, being based around KEF's 'tweeter within a woofer' Uni-Q drive unit. This concentric driver array was introduced in KEF's C-Series of 1988, after the discovery that high-power neodymium-iron-boron magnets could be made small enough for a viable tweeter inside the 'throat' of a mid/bass unit. The Uni-Q is now just about ubiquitous in the KEF range, from the top-end Reference series right down to the 11.5cm unit found in the company's E301 home cinema satellites.

It's used in full-range form in the LSX speakers we have here, mounted in a contoured baffle designed to ensure that sound is radiated outward, while reducing internal resonances. The Uni-Q concept has always been about delivering a 'point source' of sound, and this – plus the compactness of packaging the driver offers – makes it an ideal choice for a model as small as the LSX. In fact the speakers stand just 24cm tall, with their 15.5cm width and 18cm depth in proportion.

The choice of finishes – black, white, olive green or blue – plus the Kvadrat fabric wrap around the main body of the boxes, also means this is a very domestically acceptable design. The drive unit is anodised to tone or match the enclosure colour: it's silver in the black or white speakers, a light gold in the olive green, and colour-matched to the red and blue versions.

A range of accessories is available too. The slender S1 floor stands are £300 a pair; the £180 B1 wall brackets can be swivelled or angled; and the £135 P1 Desk Pads are perfect for 'desktop audio' applications, giving the speakers a slight upward tilt toward the seated listener. Furthermore, the speakers offer adjustable bass extension, with a three-position setting making it possible to compensate if the rear-ported speakers are used too close to a wall, for example.

Behind that 11.5cm drive unit, with a 19mm tweeter at its centre, is amplification rated at 30W for high frequencies and 70W for the mid/bass, all under the control of KEF's 'Music Integrity Engine' DSP [see KH's boxout, p63], the

latter also offering adjustable equalisation via a KEF app running on Android or iOS tablets and smartphones.

WIRED TOO

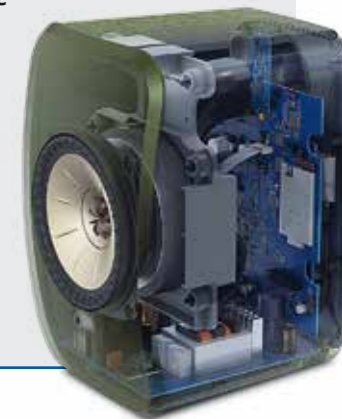
As with the LS50W, the righthand LSX speaker is the master, with all the inputs to its rear and the control systems built-in while the left is the slave, having its own crossover and amplification. The LSX offers the choice of wireless connection between the two speakers, or linking them with an Ethernet-type cable. A 3m connecting cable comes in the box, but it's possible to extend the distance using easily available 'computer cables' should you want to go down the wired route. A mains cable will be needed for each speaker, however.

The speakers also offer both wired and Wi-Fi connection to a home network, through which they can stream music from



INTEGRITY ENGINE

'Music Integrity Engine' is the name KEF gives to its custom DSP implementations. As you'd expect, hardware and software are similar in the LSX and LS50W but, given the price disparity, the LSX uses a less powerful DSP chip. As a result, whereas the LS50W runs at an internal sampling rate of 192kHz at all times, the maximum in the LSX is 96kHz – and this requires a wired connection between the two speakers otherwise it's limited to 48kHz. The key algorithms in the two speakers perform the same tasks: crossover filtering, bass management and equalisation. Low-pass and high-pass crossover filtering are performed using IIR digital filters, with phase correction using a long FIR filter. While KEF's head of acoustics Jack Oclew-Brown describes the latter as 'relatively textbook', it is tweaked to reduce pre-ringing in the step response to avoid the treble sound becoming glassy. Dynamic bass extension lowers the LF corner frequency at low sound outputs, and adjusts it upwards to protect the driver at higher bass levels. KH



LEFT: A 115mm UniQ driver with concentric 19mm alloy dome tweeter is driven via built-in 70W and 30W amplifiers, respectively, all under user-configurable DSP control. Numerous driver/cabinet colours are offered

the LSX is certainly a very good Bluetooth/AirPlay 2 speaker system, and a world away from the inexpensive alternatives many listeners seem happy to run cranked within an inch of their life, but this capability is largely wasted. So, as is usual with these wireless protocols, I find the sound rather parched and uninteresting, and more of a chore to listen to than a delight.

There are no such problems when the LSX is used either via its analogue/digital inputs or streaming from a network or online source. Here the surprising weight available from these little speakers combines with a smooth yet informative midband and treble to give much more musical involvement. And what's also clear is the remarkable focus available from those Uni-Q drivers when driven actively. They give a highly credible soundstage with the speakers a few metres apart, about the same distance from the listener and with a slight toe-in, and also focus elements within the mix with great precision.

As well as trying the LSX in 'main room' mode, I also listened to the speakers in desktop audio guise. They proved very enjoyable when used as nearfield monitors, giving a striking sense of insight into recordings when parked either side of my computer. With the superb intimacy of the one-mic-recorded jazz of Reinier Voet & Pigalle 24 on the *Ballade Pour La Nuit* album [SoundLiason SL-1035A] the

local storage (for example on a computer running DLNA/UPnP server software or a NAS device) or online services including Spotify Connect and Tidal. Both Bluetooth with aptX and Apple AirPlay 2 are available, and the LSX is also Roon compliant.

Physical audio connections run to optical digital and 3.5mm stereo analogue inputs, while there's also an analogue subwoofer output, should you feel the need for more bass or perhaps want to use the speakers in a larger space.

At its most basic, you can use the LSX as a glorified Bluetooth speaker, or with sources connected via analogue or digital sockets, and not need a network connection. A remote handset is provided, and for this simple operation that's about all you will need. However, switch to network/online streamed content, and you'll need a display to see what you're

accessing, which is where the app comes in – or rather another app comes in.

You see, while there's one KEF app to set up the speakers, adjust their various DSP parameters, and carry out any firmware update, you need a second app, called KEF Stream, to actually play music through them. That seems just a shade clunky, but at least it keeps the Stream app relatively clear in use as a trade-off.

WORTH THE WEIGHT

With that app-juggling done, it was simple to use the LSX as a streaming device, connect via the audio inputs and play music straight to it using a selection of portable devices, both Android and Apple.

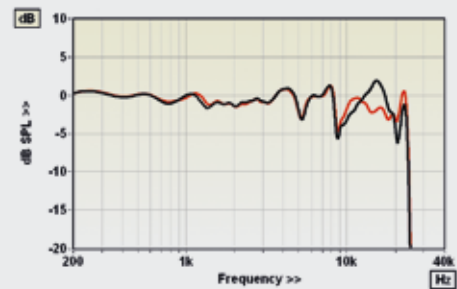
I should admit, however, that this last means of using the speakers, while convenient on an ad hoc basis, is far from my favourite way of playing music. True,

LAB REPORT

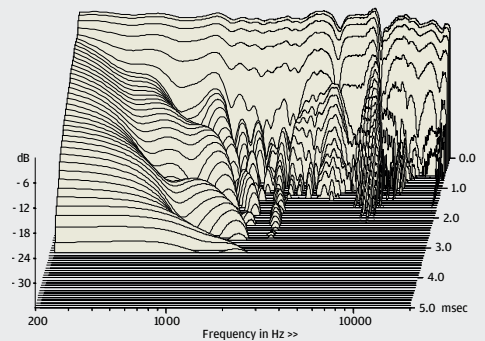
KEF LSX

It's natural to think of the LSX as a junior, cut-price LS50W [HFN Oct '17] so how does it square up to KEF's original compact, two-way, DSP active loudspeaker? All our measurements were made via the LSX's analogue input at the default internal sampling rate of 48kHz. Attempts to repeat the measurements using the LSX's optical S/PDIF input failed, possibly because of the LSX's asynchronous sample rate converter. Conventional sensitivity measurement is not meaningful with the LSX, of course, so the on-axis frequency responses [Graph 1, below] have been normalised to 0dB at 1kHz on the left channel. The traces are rather different to those we obtained from the LS50W. Up to 3.5kHz the LSX's response is actually smoother as it avoids the LS50W's dip at 1.7kHz, but thereafter it becomes significantly less even with notable dips at 5.1kHz and 8.8kHz. The rapid roll-off above 22kHz is, of course, due to the 48kHz internal sampling frequency.

Difficulty with KEF's control app prevented 96kHz operation being selected but, on past experience with KEF's small Uni-Q drivers, the response should reach out to above 40kHz, albeit with a high-Q resonance peak at around 38kHz. Because of the treble unevenness, the LSX's response errors are somewhat higher than the LS50W's at ± 3.9 dB and ± 3.0 dB, respectively, (we obtained ± 2.2 dB from both samples of the LS50W) but not excessive by any means. What is disappointing is the high pair matching error of ± 2.8 dB over the same 200Hz-20kHz range, but this is largely accounted for by the disparity in final octave responses between 10kHz and 20kHz. Below 9.2kHz, pair matching error reduces to an excellent ± 0.6 dB. In the CSD waterfall [see Graph 2] both of the aforementioned treble dips are seen to be associated with resonances. KH



ABOVE: Forward response is impressively flat through bass and midrange, but presence/treble is less even



ABOVE: The notches in frequency response [above] at 5kHz and 9kHz are revealed as driver resonances here

HI-FI NEWS SPECIFICATIONS

Frequency Response error (300Hz-20kHz)	± 3.9 dB / ± 3.0 dB
Pair Matching (300Hz-20kHz)	± 2.8 dB
LF extension (-6dB ref 200Hz)	47Hz
HF extension (-6dB ref 10kHz)	24.2kHz / 24.4kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	1.9% / 0.2% / 0.1%
Dimensions (HWD) / Weight (each)	240x155x180mm / 3.6kg



LEFT: A wide choice of input options is available via the right (Master) speaker back panel, including analogue via a 3.5mm jack socket, Toslink optical, wired and wireless Ethernet and Bluetooth

Naxtras [NXTRS01; NativeDSD.com] played via Roon, the little KEF speakers do an excellent job with the pounding rhythms' Eastern influences and the dense mixes, allowing individual lines to be followed.

Meanwhile, in the perhaps more familiar territory of Drake's

expletive-laden *Care Package* rap [a Tidal Stream] the LSX speakers thump out the backing tracks as well as they do the stream of invective on the opening 'Dreams Money Can Buy' before settling into an easier groove with 'The Motion'.

Take a swerve to the oh-so-polite and beautifully recorded Diana Krall on her *Turn Up The Quiet* album [Verve 00602557352177], and the LSXs are in their element with the kind of low-challenge sound beloved of hi-fi demonstrators the world over. However, what's being played still stays interesting even with the volume wound down to background dinner-party levels. Which is nice... ⬇

HI-FI NEWS VERDICT

Seriously, these are very fine little active wireless speakers, with no shortage of ability partnered with simply masses of convenience. They'll provide a background to your life with minimal fuss, then ramp up the involvement when required. In short, their combination of price, style, performance and 'just add - well nothing, actually' complete specification makes them a highly attractive real world buy.

Sound Quality: 89%



LSX's are able to create an almost holographic image of the musicians ranged in front of the listener.

Add to this rock-solid positioning a wonderfully relaxed feel, plus a good sense of space, and this played into the hands of some excellent live Proms broadcasts. With TV sound connected via optical digital, the speakers confirm their user-friendly nature by opening up the sound of broadcasts while still maintaining the illusion of a performance coming from the screen.

No, they won't quite stretch to that wall-busting impression of your room extending out into the expanse of a concert-hall. But don't think any size-related limitations mean these are speakers best suited to small-scale music.

POUNDING RHYTHMS

Playing the massed forces of the Utah Symphony and the Mormon Tabernacle Choir in the opening of Mahler 8 [Fresh! FR-725], the sound may well be a little more 'symphony of several hundred' rather than the full thousand, but there's no denying that the LSX is able to punch above its relatively modest weight. And that ability stands it in good stead with rock and pop too.

With the one-take live sound of the self-titled album by Greek psychedelic rock merchants