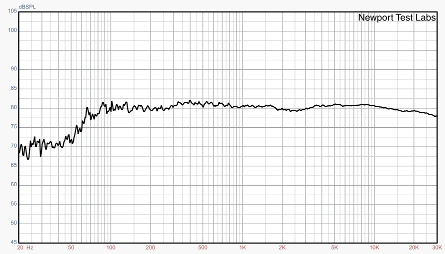
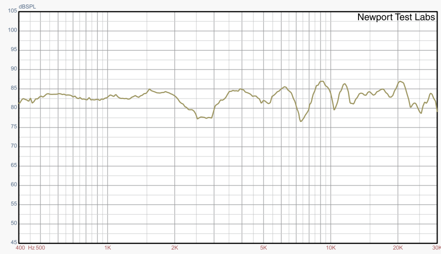
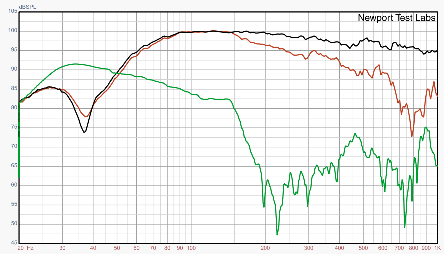


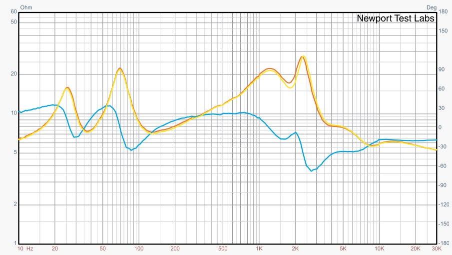
Graph 1. Frequency response. Wideband pink noise test stimulus, capture unsmoothed. Microphone at 3 metres, on axis with supertweeter. [JBL LS80 Loudspeaker]



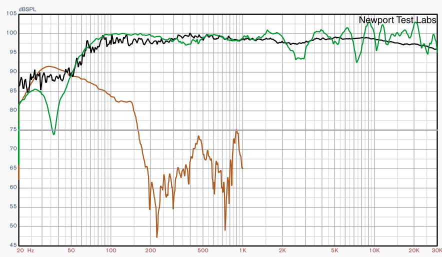
Graph 2. High-frequency response, expanded view. Test stimulus gated sine. Microphone at three metres on-axis with dome super tweeter. Lower measurement limit 400Hz. [JBL LS80 Loudspeaker]



Graph 3. Low frequency response of both woofers and rear-firing bass reflex port (green trace). Nearfield acquisition. Upper woofer (Black). Lower woofer (Red). Port/woofer levels not compensated for differences in radiating areas. [JBL LS80 Loudspeaker]



Graph 4. Impedance modulus of left (red trace) and right (yellow trace) speakers plus phase (blue trace). [JBL LS80 Loudspeaker]



Graph 5. Frequency response. Composite plot. Black trace shows unsmoothed pink noise response (from Graph 1). Green trace is the summed nearfield sine response of the bass drivers spliced (at 400Hz) to the far-field gated response of the tweeter and super-tweeter. The red trace is the nearfield response of the bass reflex port. [JBL LS80 Loudspeaker]

Test Results

The frequency response of the JBL LS80 was excellent—very flat and tremendously extended, as you can see from *Graph 1*. The trace shown in this graph is the unsmoothed response gained when using a wideband pink noise test signal. As you can see, the trace virtually 'hugs' the 80dBSPL line right across the graph. The actual response shown extends from 60Hz to 30kHz ±3dB—and that upper limit is the graphing limit, not that of the LS80. From the look of the LS80's response between 20kHz and 30kHz, the response would still be going strong well above 30kHz. As you can see, the overall response starts rolling off below 100Hz, but once it's 10dB down (42Hz) it 'shelves' (about which more later) so you can still expect relatively strong bass all the way down to 20Hz.

The reason for the 'shelf' is apparent when you look at *Graph 3*, which shows nearfield traces for both woofers and the rear-firing port. Most speaker designers tune the port so the maximum output is directly above the point at which the bass driver(s) are delivering their minimum output (at around 37Hz in the case of the LS80, as you can see from the 'valley' at this frequency). However, JBL has tuned the port on the LS80 so its maximum output is at 33Hz, which means it delivers more deep bass than it otherwise would. Despite the very large diameter of the port, I was very surprised—and very pleased!—to see that there's very little 'leakage' of higher frequencies through it. There are minor 'leaks' at 460Hz and 900Hz, but they're at insignificantly low levels. The linearity and extension of the bass drivers is self-evident, and you can clearly see on the graph how JBL runs the upper bass driver right out beyond 1kHz, but starts rolling the lower driver off at 150Hz.

The measured high-frequency performance of the LS80 has no doubt been influenced partly by the horn loading of the tweeter, but more so by path length interference effects. It's all these that combine to deliver the 'jagged' appearance of the trace. In fact, the Q of the peaks and valleys is so high that to the human ear the response would sound 'smooth', so that the overall response would be as shown in *Graph 1*. However, you can see that the excursions are not excessive in any case, amounting to around ±4.5dB.

The JBL LS80's impedance trace is mostly controlled. The technical difficulties of incorporating the compression driver are clearly visible in the 1–2kHz region, however since the impedance does not fall below 7Ω at any point between 15Hz and 6kHz, the LS80s will be an easy load for any amplifier or AV receiver, despite the higher-than-usual swing on the phase angle. The trace shows impedance falls slightly between 12kHz and 30kHz: I would have preferred to see it remain level or, even better, increase slightly. System resonance is at around 37Hz and the pair matching is very good, with only a very slight discrepancy visible around 1.8kHz. Overall, I'd agree with JBL's assessment of the nominal impedance as being 6**Ω**.

Sensitivity was excellent—as you'd expect from a JBL!—with *Newport Test Labs* reporting a figure of 89.3dBSPL at 1-metre, for 2.83V input, under its standard test conditions. This is marginally less than JBL's 90dB spec, but because under NTL's test conditions it's far tougher for a speaker to get a 'high' figure, the 89.3dB figure returned by the LS80 is higher than the average, and an excellent result.

Graph 5 is a composite graph, basically showing how the various different frequency responses measured for the JBL LS80 'relate' to each other, after having been manually re-scaled so they can be overlaid. In this graph, the green trace is actually two different traces that have been manually 'spliced' together at 400Hz by post-processing. Below this frequency, the response is the nearfield response of the woofers (effectively, the 'anechoic' response). Above it, you're looking at the gated far-field response, measured on-axis with the super-tweeter. The black trace, which is the unsmoothed response using pink noise, neatly demonstrates how the ear would 'hear' those peaks and valleys visible in the far-field response: basically, it would average them.

JBL has the most advanced research and development facilities of any loudspeaker manufacturer in the world, and all that extensive expertise is evident in the measured performance of the LS80, which is absolutely first-rate.

Steve Holding