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JBL STUDIO 130 REVIEW AND TEST

Product Name: JBL Studio 130
Product Type: Loudspeakers
Price: $399.00
Reviewed By: Greg Borrowman
Magazine: Australian Hi-Fi Magazine Nov/Dec 2011
Distributor: Convoy International Pty Ltd
Who Sells What/Website: JBL

JBL Studio 130 Loudspeakers Review and Test Report

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Back in the '60s and '70s, it was easy to tell a professional recording studio from a 'wannabe'. You only had to go in and look at their monitor loudspeakers. All professional recording studios used JBL Studio Monitors. It was as simple as that. Although these days the market has diversified such that JBL no longer has the stranglehold it once had, you'll still find JBL's Studio Monitors in the majority of recording studios right around the world.

The Equipment

Although JBL prefixes these speakers with the word 'Studio'—no doubt to try to garner some of the cred of its real Studio Monitor models, such as the JBL 4429 Studio Monitor—the Studio 130 is a very small two-way design that would be most at home serving as the surround channel speakers in a 5.1-channel home theatre speaker system. Indeed they were released as a part of JBL's 'Studio 1 Series' which comprises two floor-standing models (Studio 190 and Studio 180), a centre-channel (Studio 120c) and two subwoofers (Studio 140P and 150P).

The styling of the Studio 130 seemed odd to me at first, being far taller and narrower than I thought they should be. It wasn't until I looked at the floor-standing models in the 'Studio' range that I realised that their unusually tall and narrow front profile in fact echoes the styling of the floor-standing models in the range. JBL obviously intended that all the speakers should be cosmetically matched, and thus more visually appealing when used together, such as in a home theatre speaker system. That said, the 'tall', narrow style will also work really well if you're using the Studio 130s as front-main speakers, and putting them either side of a video monitor… which you can, because they're magnetically shielded. And when I say 'tall and narrow', each speaker is 349mm high, 165mm wide and 210mm deep.

The narrow front baffle effectively limits the size of the bass/midrange driver that can be fitted to this speaker, so the Studio 130 has a single 100mm diameter bass driver with a 'PolyPlas' cone. The word 'Polyplas' is proprietary to JBL, as is the manufacture of the driver itself, but in essence, the cone is initially formed from paper (cellulose fibre) after which it's coated with a thin layer of plastic (polymer). This construction approach delivers the light weight and high strength of a paper cone, but protects the paper from dampness, which can increase cone weight (slowing it down) and reduce cone stiffness. (Interestingly, JBL's US website says the Studio 130 has "dual 4" PolyPlas low-frequency transducers", but this is simply a mistake that may have been rectified by the time you read this review. The Australian distributor's website [www.e-hifi.com.au] has the correct specifications.)

The dome tweeter in the Studio 130 is 25mm in diameter and the dome appears to be made from metal, though JBL

says the material is ‘CCMD’ which stands for ‘Ceramic Metal Matrix Diaphragm.’ The nominal crossover frequency is 3kHz and slopes are stated as being 12dB/octave. The dome is positioned at the base of what JBL refers to as a ‘bi-radial constant directivity waveguide’. It appeared to me that the tweeter has a phase corrector fitted as well… though this might have been simply to protect the dome. Just in case you were wondering, a ‘waveguide’ is a device that transforms the radiation characteristics of the driver with which it’s associated, and a ‘bi-radial’ version transforms the radiation in two planes. In the case of the Studio 130 it does so both in the horizontal and in the vertical.

If, like me, you were wondering about the JBL ‘Weave design’ that JBL says it uses for the Studio 130, the ‘Weave’ simply refers to the visual appearance of the loudspeaker and, in the Studio 130, this design manifests as the ‘bow-tie-shaped’ plastic extrusion attached to the front baffle and to the two irregularly-shaped grilles, the top-most of which has six sides, and the bottom-most seven! In each case, two of the sides are also bevelled, creating even more angles.

Around the back of the speaker is a single pair of standard multi-way gold-plated speaker binding posts that accept stripped wire, banana plugs, or spades and a bass reflex port. The speaker finishes available are black or cherry.

Listening Sessions

As a part of Harman International, the world’s largest consumer electronics manufacturing conglomerate, JBL has several enormous advantages over almost all its competitors. First amongst these is that Harman employs not one, but several of the world’s most famous and celebrated speaker designers, all of whom have a hand in JBL’s designs. Second is that JBL maintains a special ‘listening room’ that it uses to bench-mark its designs against those from other manufacturers, using strictly controlled A–B listening sessions using its own expert listeners and also ordinary consumers. Third is that JBL essentially makes all its own drivers: it doesn’t buy ‘off the shelf’ drivers from third parties, or develop ‘special versions’ of drivers from other manufacturers. Fourth is that the company is so large that it always builds its speakers in large quantities, which allows it to keep its production costs very low, so it can deliver very keen retail pricing.

The reason for this preamble will become obvious moments after you hear a pair of Studio 130s, because despite those small, unusually-shaped cabinets and the seemingly-impossibly low price, these speakers sound very good indeed. No, there isn't too much bass, but in real life, you'd be pairing the Studio 130s with a subwoofer, either in a 5.1-channel AV set-up or in a 2.1-stereo system.

However, such is the linearity and clarity of the midrange, and the spread and extension of the high-frequencies, that you'll be captivated by the overall sound, and the bass that is present is so clean and precise that you'll find that your ear is easily convinced that there's more deep bass issuing from the Studio 130s than there really is. Sufficient bass, indeed, that if you have a smallish room you may even decide that's there's no need for a subwoofer. Indeed if you live in a flat or apartment, where low bass can cause neighbour problems, the limited bass could even be an advantage.

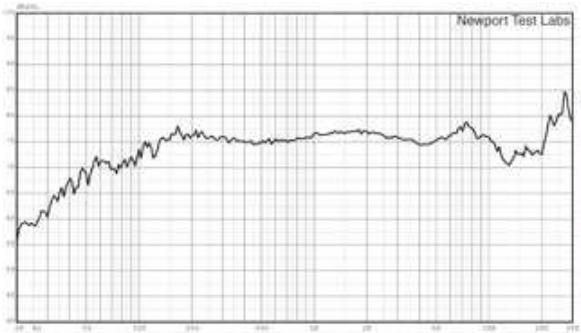
I partnered up the Studio 130s with a few different subwoofers, but mostly I used JBL's own Studio 150P, in 2.1-channel configuration. With a subwoofer filling in the deep bass, the overall sound was excellent. The midrange was clean and nicely balanced; the high-frequencies well-extended. Speaking of the high frequencies, the dispersion of these was excellent—JBL's horn really does its job well, so that even if you're sitting 'way off axis, you won't miss out on any of the highs. Stereo imaging was exceptionally good. The fact that all the speakers in JBL's Studio 1 series have 'voice-matched' drivers means you can 'mix n match' different models if you want to build a 5.1-channel system… or you could simply use two pairs of Studio 130s, a Studio 150P, and a Studio 120c.

Conclusion

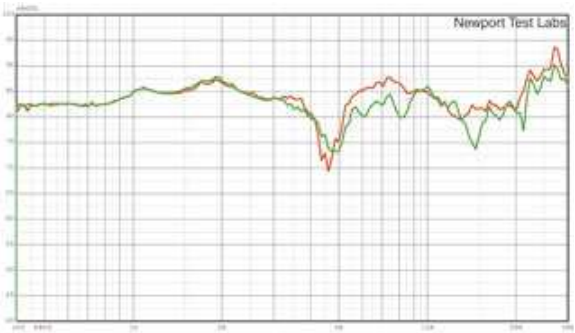
I can think of lots of reasons to buy a pair of Studio 130s. One I have not mentioned so far is that they'd make great computer monitors! (Just add a little amplidac to drive them.) Another is that if you're just starting out in hi-fi, you could buy a pair for use as main speakers, then, as finances permit, add larger main speakers at a later date and then relegate the Studio 130s as rear or surround speakers, or simply put them in another room, or maybe re-purpose them as computer monitors.

Whichever way you decide to go, you're assured of JBL's quality (and cachet!) and also of the excellent after-sales support that is provided by Convoy, which has now been JBL's Australian distributor for more than 15 years. **Greg Borrowman**

Test Results



Graph 1. Composite frequency response plot. Trace below 5.6kHz is the averaged in-room pink noise response smoothed to one-third octave. Trace above 5.6kHz is the response using a gated sine test signal (simulated anechoic). [JBL Studio 130 Loudspeaker]

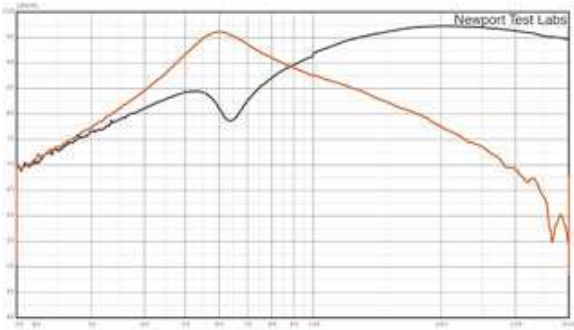


Graph 2. High-frequency response, expanded view. Test stimulus gated sine. Grille on (green trace) and grille off (red trace). Microphone placed at three metres on-axis with dome tweeter. Lower measurement limit 400Hz. [JBL Studio 130 Loudspeaker]

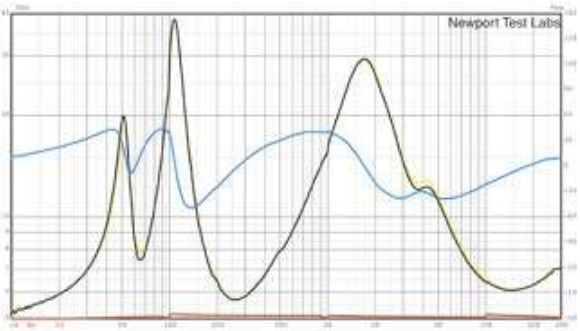
The frequency response of the JBL Studio 130 shown in Graph 1 is actually two different traces spliced together at 5.6kHz. The trace below this frequency is the averaged in-room response using a pink noise test stimulus. The trace above 5.6kHz is a gated sine response, which simulates the result that would be obtained in an anechoic environment. As you can see, the overall response is very smooth and flat. If we ignore the very small level variations, the Studio 130's measured frequency response is 60Hz to 22kHz ±3dB—exactly the same as JBL's specification. However, you can see that the response rolls off 6dB from around 160Hz (where it's at +3dB) to 55Hz (where it's –3dB), so I'd expect this speaker to sound 'bass-shy' as a result. There's also a suck-out in the response between 10kHz and 20kHz, but I would not expect this to be audible except, perhaps, as a slight softness in the extreme high-frequency harmonics.

Graph 2 shows a more detailed view of the Studio 130's high-frequency response, using a gated sine technique. This more detailed analysis reveals there is a dip in the response centred at 4.5kHz, but this is partially a measurement artefact caused by cancellation at the microphone due to the proximity of the microphone to the loudspeaker and the considerable distance on the front baffle between the bass/midrange driver and the tweeter. This dip would not be audible to the ear because of the very high frequency at which the dip occurs (the highest note on a piano is 4.1kHz) and the narrow range of frequencies affected (effectively just two whole tones). What the human ear would actually 'hear' is shown on the pink noise response in Graph 1, where you can see there's only a very small, shallow depression in the frequency response at the corresponding frequency.

Low frequency performance is shown in Graph 3, using a near-field measurement technique. You can see that the response of the bass/midrange driver starts rolling off below 200Hz though it does so off a slight peak and rolls off quite slowly to a minima at 63Hz. The output of the port peaks slightly lower (60Hz) and there's quite a lot of output above 60Hz from the port, which is why the pink noise trace in Figure 1 has that 'step' around the same frequency. It seems obvious to me that JBL's engineers have tuned the port to achieve bass extension and paid the price of slightly less output in the region 70–100Hz.



Graph 3. Low frequency response of front-firing bass reflex port (red trace) and woofer. Nearfield acquisition. Port/woofer levels not compensated for differences in radiating areas.



Graph 4. Impedance modulus of left (black trace) and right (yellow trace) speakers plus phase (blue trace). Red trace is reference 5-ohm calibration resistor. [JBL Studio 130]

The Studio 130's impedance is shown in Graph 4. The pair-matching is excellent, particularly given the low price-point, which shows excellent quality control on the part of JBL. You can see the system resonance is at 65Hz and that the average impedance modulus stays higher than 7Ω over the majority of the audio band, though it dips to 6Ω at 20Hz, to 5.7Ω at 250Hz and again to 6Ω at 15kHz.
Overall, I'd quantify the design has having a nominal impedance of 6Ω under the relevant IEC ruling (IEC 268-5.16.1). The trace shows that there are some very minor cabinet resonances at 200Hz and 500Hz. The tweeter's resonant peak is quite obvious at 27kHz. The crossover point is also clearly visible, evidenced by the disturbance on the impedance trace around 3.5–4.5kHz. Overall, the impedance is very 'amplifier friendly'.

JBL rates the sensitivity of the Studio 130 at 87dBSPL, but Newport Test Labs measured it to be 83dBSPL. Newport Test Labs' testing methodology is so strict that using its particular technique, almost all speakers measure 'low'—particularly small speakers—because NTL's test methodology averages sound pressure levels across a very wide bandwidth (20Hz–20kHz) and therefore effectively 'penalises' speakers that do not have an extended low-frequency response, so in real terms, you'd probably expect an efficiency of around 84–85dBSPL when listening to music program material.

The JBL Studio 130 is a very well-designed loudspeaker system that has a particularly flat frequency response across the all-important midrange and an extended high-frequency response.

Steve Holding

Who Sells What: JBL

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