

JBL

Studio 150P

SUBWOOFER



JBL has always thought outside the square, right back from when good ol' James B. Lansing founded the company 'way back in 1946—though it started out as Lansing Sound Inc before he switched to using his own initials.

JBL has been owned by Harman International (the world's largest audio/video conglomerate and home to other famous brands including harman/kardon, Mark Levinson, Infinity, AKG and half-a-dozen other) for a good many years now (since 1969, in fact), but it hasn't seemed to make any difference to the fact that its engineers are still thinking outside the square and continually come up with innovative designs that are distinctively different from what other speaker manufacturers are offering. For proof of the truth of what I'm saying, you don't have to look any further than the new JBL Studio 150P subwoofer, because in a world where subwoofers are almost universally square or rectangular, the Studio 150P is, umm... trapezoidal? (B&W's impressive PV1 subwoofer is, perhaps an even-more-fabulous exception to the rule, on account of it looking more like a bowling ball than a subwoofer, but that's by-the-by!)

THE EQUIPMENT

JBL hasn't just built the Studio 150P to be different as such, it's also been designed specifically to integrate visually (and acoustically) with the company's new 'Studio Series' of two-channel and home theatre speakers, which feature what JBL calls its 'Weave' design. This 'weave' is just a cosmetic device that imitates the exterior contours of a wicker basket—albeit one that uses extremely thick (and rather angular) strands. It's certainly a 'different' look, but as with all imagery, beauty is in the eye of the beholder: so for every

person who likes JBL's 'weave' look, there'll be another who doesn't. The same could very well be said of the squat trapezoidal shape of the Studio 150P subwoofer which—at least to me—looks like a shorter version of Davros, the leader of the Daleks from the Dr Who series.

The Studio 150P has a single down-firing bass driver, whose cone is made from a material that JBL calls 'PolyPlas', a name it has registered as a trademark. (Harman has more than 300 such names trademarked). Whatever the cone is called, it is in essence a paper cone that has been coated with a thin layer of plastic. If you'd prefer a more technical description of this type of construction, I think 'polymer-coated cellulose fibre' would fit the bill admirably. As in the 'rose by any other name' description, it's an excellent material for a woofer cone because paper is actually one of the best materials from which to construct a large-diameter loudspeaker cone. Paper cones of this size are extraordinarily strong, have excellent self-damping, and are (if well-made!) incredibly low in mass. The only real problem with large paper cones is that they're hygroscopic, which means that they tend to absorb moisture, so when it's humid, they'll become heavier and less stiff, which in turn will affect their performance. However, if you coat the paper with a layer of plastic, this makes the cone a little heavier, but at the same time prevents the paper from absorbing water, so its properties remain constant irrespective of humidity. JBL rates the cone as being 10-inches (they are American, after all!) in diameter, which translates to 254mm here in Australia. This is the minimum driver size I consider necessary for a subwoofer cone. Alongside it is a large circular bass reflex port.

In common with most subwoofer manufacturers, JBL has elected to fit a Class-D switching amplifier inside the Studio 150P, which it rates with an output of 300-watts continuous. This type of amplifier has the advantage of being relatively inexpensive, which means more money can be invested in the cabinet and driver, and also runs very cool, so there are no sharp-edged heat-sinks on the rear panel of the subwoofer necessary to get rid of excessive heat (though JBL does warn that the plate gets *'quite warm during normal operation'*). Perhaps most importantly, Class-D's *'Achilles' Heel*, which is its 'variable' performance at high frequencies, does not come into the picture when it's used in a subwoofer, because the amplifier is not called on to reproduce any high frequencies! Another advantage that stems from the efficiency of Class-D amplifiers is that the one inside the Studio 150P won't impact on your power bill at all: it draws less than 1-watt in standby and pulls just 320-watts when operated 'pedal to the metal.'

Around the back, the Studio 150P sports rotary volume and 'crossover' controls on its sloping surface. Although labelled a 'crossover' control, it would be better described as a low-pass filter. The volume control has a smooth action, and lacks calibration markings. The crossover (low-pass) frequency can be adjusted anywhere from 50Hz to 150Hz, and there are dot markings at each 10Hz increment, so you can easily set it to, say, 90Hz if you already know the 3dB downpoint of the speakers you're pairing it with. Once it's been set at a particular point, the internal crossover rolls off the subwoofer's output above that frequency at a fairly steepish 24dB per octave.

JBL also provides a method by which you can bypass the internal crossover completely, in the form of a bypass switch that, instead of being labelled 'Bypass' is instead labelled 'Input' and given two positions: 'LFE' and 'Normal.' To use the LFE input, you simply connect a single cable from the LFE output on your AV receiver to the Left Channel input on the Studio 150P. Although the Studio 150P has line-level inputs, it does not have 'Speaker Level' inputs, so if you're using it with an AV receiver that lacks an LFE output, or an integrated amplifier, you'll need to drive it from a pair of pre-amp outputs.

Only a single two-position phase switch is fitted, rather than my preferred rotary control (preferred because it allows continuously variable control over phase) but I suppose cost plays a part, because the Studio 150P is a budget subwoofer. The same goes for the power switching. The Studio 150P has only a single mains power switch. When this is on, the subwoofer automatically goes into 'signal sensing' operation, which means that when it detects a signal at the input, it switches itself on automatically. If no signal is present, it waits a while then automatically switches to Standby. (The other option often provided by subwoofer designers is a secondary power switch that allows consumers to choose between 'forcing' the subwoofer to stay permanently on, or optionally selecting the signal-sensing mode—usually called 'auto'.) You can check the Studio 150P's operational state by looking at the chameleon LED on the rear panel. If it's glowing red, the subwoofer is in Stand-by mode; if it's glowing green, the subwoofer is active and operational.

If you're already wondering how the Studio 150P would look in your living room, you'd better take its size into account. It measures 470×441×441mm (HWD).

LISTENING SESSIONS

The fact that the bass reflex port is located alongside the bass driver underneath the subwoofer greatly expands the placement opportunities for the Studio 150P, as does the fact that it's only 470mm high, which means you may be able to fit it underneath a table—even a corner table, because a subwoofer can be placed in a corner if you wish, unlike most full-range stereo speakers. You do, however, have to make sure the subwoofer is placed in such a way that its performance at the listening position is maximised. This is a quite simple but somewhat time-consuming


exercise that I have detailed in a number of previous subwoofer reviews in Australian Hi-Fi Magazine so, rather than bore regular readers who've read the same explanation before, a description of how to correctly position a subwoofer in a room—any subwoofer!—has now been posted here: www.tinyurl.com/subwoofer-placement)

However, the down-firing nature of the design means that you will have to ensure is that the Studio 150P's four feet keep the cabinet well clear of the floor. Each foot has a fairly large surface area, so you probably won't have to take any particular steps to ensure this happens, but if you have luxuriously soft carpet underlay and/or a very thick carpet, you may have to 'spike' the feet to ensure the 'slot' between the edge of the cabinet and the floor is kept clear.

I used the Studio 150P in conjunction with a pair of JBL's small Studio 130 speakers, as well as with larger speakers made by another manufacturer. In both cases, I aligned the subwoofer using a chromatic scale from one of my test CDs, adjusting the volume, crossover and phase controls to give the most linear, most realistic response at my listening position. This meant that with the Studio 130s, I had the crossover control two notches down from the maximum 150Hz position, whereas with the large floor-standing speakers, the same control was right down at the 50Hz position. Performance was excellent at both extremes of the crossover control, with the JBL Studio 150P delivering strong and extended bass response that was not marred by the presence of unwanted higher frequencies. The bass driver was very quick, so that when paired with the Studio 130s it was difficult to hear any differences in tonal quality when the bass response of the Studio 130s had 'run out' and so the subwoofer was doing all the hard work down in the depths. OK, so some of this was because of the similarities between the drivers in the Studio 150P and the Studio 130s, but the remainder was just the sheer quality of the Studio 150P's PolyPlas driver, and the tuning of the subwoofer. Initially, I was a bit worried that the plastic 'Weave' moulding at the top of the 150P might rattle or resonate, but I didn't hear any evidence of this with any of the music I played... and I played just about every genre there is! In terms of differences between having the crossover control at 50Hz or 150Hz, the only one that was clearly evident was that I could play the

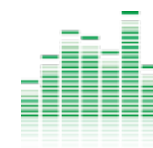
Studio 150P much louder when the control was at the 50Hz position than I could when it was set at 150Hz.

CONCLUSION

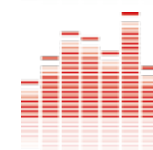
Even if you're not keen on the shape of JBL's new Studio 150P you'll be thrilled by its performance, because it's JBL through and through, with tight, deep and fast bass and a clean tonal quality that stays true-to-life irrespective of how loud you listen.  **greg borrowman**

JBL STUDIO 150P Subwoofer

Brand: JBL
Model: Studio 150P
Category: Powered Subwoofer
RRP: \$999
Warranty: Five Years
Distributor: Convoy International Pty Ltd
Address: Locked Bag 970
 Botany NSW 2019
 ☎ **1800 817 787**
 ☎ **(02) 9700 0111**
 ☎ **(02) 9700 0000**
 ✉ **info@convoy.com.au**
 🌐 **www.e-hifi.com.au**



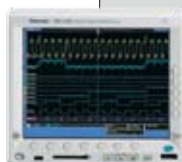
- Unusual cabinet
- Easy placement
- Excellent bass response



- Unusual cabinet
- Can't force 'on'
- Lacks spkr level inputs

LAB REPORT

Readers interested in a full technical appraisal of the performance of the JBL Studio 150P Powered Subwoofer should continue on and read the LABORATORY REPORT published on page 114. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.



Lab Report on page 114

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LABORATORY TEST RESULTS

The nearfield graphs of the JBL Studio 150P's performance show that JBL's engineers have done something quite interesting with this subwoofer, in that they've tuned the port somewhat higher than usual, presumably to get a smoother frequency response where it really counts, rather than simply trying to extend the bass downwards to get an impressive specification. So whereas I would have expected the port's output to peak at around 27Hz, it actually peaks at around 33Hz. The port's output varies a little with changes in the low-pass filter, so there's obviously some amount of higher-frequency 'leakage' of sound through the port, but it's insignificant. The nearfield traces also appear to show that there's a port/cabinet effect at around 60Hz that affects the responses of both the driver and the port, but the far-field responses (Graphs 3 and 4) don't show any suck-out at this frequency, so 'it's all good', as they say.

There are five traces in all on Graph 1, two of these (the green ones) show the nearfield output of the port, while the other three show the nearfield frequency response of the down-firing woofer. The traces are not strictly accurate because they don't take into account the effect of the floor-loading of the design, but this is simply a limitation of the nearfield measurement

system. Even so, you can see the response is very linear. In the LFE (bypass) mode, the driver's response extends from 36Hz to 230Hz ± 3 dB. At the maximum 150Hz position of the low-pass control, the driver's response extends from 38Hz to 150Hz. (Don't forget that these responses don't include the contribution from the bass reflex port, which extends the bass response



I found the measured performance of the JBL Studio 150P Subwoofer to be excellent, and also in complete accord with the company's own specifications. Full marks to JBL...

significantly, as I'll detail in a moment.)


In Graph 2, *Newport Test Labs* has graphed the output of the bass reflex port for the 50Hz and 150Hz low-pass filter settings and also for the LFE setting. You can see that the port has a resonance at 450Hz, but this appears only because the test signal isn't pre-filtered, as it would be if the signal were coming from the LFE output of an AV receiver. So in real use, there would be no resonance.

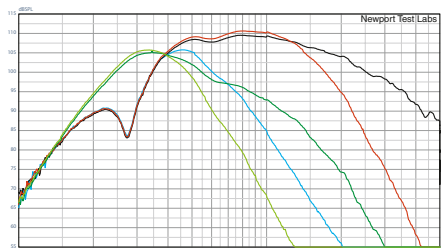
The 'true' frequency responses of the JBL Studio 150P, where the output of the port is combined with that of the driver itself, and the floor-loading is also taken into account, are shown in Graph 3, using pink noise as a test stimulus.

You can see the 'flattest' response is delivered using the LFE mode, so if your AV receiver has an LFE output, this is how you should connect the Studio 150P. In this mode, the JBL's response extends from 27Hz to 350Hz ± 3 dB, but the upper limit would be lower, as it would be attenuated by the receiver itself. When the low-pass filter is set to

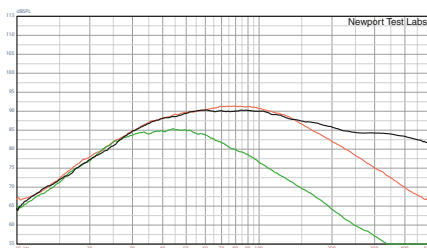
150Hz, the Studio 150P's response extends from 29Hz to 160Hz ± 3 dB. These are all so close to JBL's own specification (27–150Hz -3 dB) that the differences are academic. If you have large floor-standing speakers that allow you to set the low-pass filter to its lowest setting (50Hz), the response in this position is 21Hz to 90Hz ± 3 dB.

Newport Test Labs included one extra graph with its report (Graph 4) which compares the JBL Studio 150P's far-field response with pink noise to its nearfield response (measured with sine waves). This more clearly shows the nice alignment selected by JBL's engineers, which neatly 'splices' the divide across the region 30–48Hz and the disappearance of the 'suck-outs' noted earlier at 60Hz.

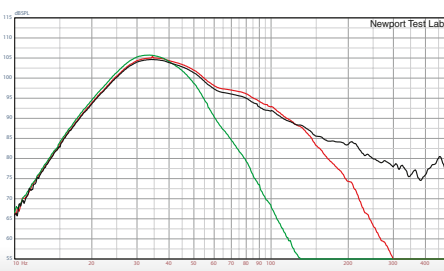
I found the measured performance of the JBL Studio 150P Subwoofer to be excellent, and also in complete accord with the company's own specifications. Full marks to JBL and its engineering team.  **Steve Holding**



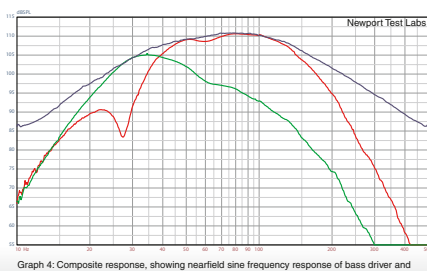
Graph 1: Nearfield sine frequency response of bass driver and port. Graph shows bass driver response with crossover control set to 50Hz (blue trace), 150Hz (red trace) and LFE (black trace), and port with crossover set to 50Hz (light green trace) and 150Hz (dark green trace). (Note that data for port has not been re-scaled to compensate for differences in radiating area.) (JBL Studio 150P Sub)



Graph 3: Pink noise frequency responses (smoothed to one-third octave via post-processing) at 2-metres with crossover control at 50Hz (green trace), 150Hz (red trace) and LFE (black trace).



Graph 2: Nearfield sine frequency response of port with crossover control set to 50Hz (green trace), 150Hz (red trace) and LFE (black trace). (JBL Studio 150P Subwoofer)



Graph 4: Composite response, showing nearfield sine frequency response of bass driver and port with crossover control set to 150Hz and overall pink noise response smoothed using an external third octave filter. (Note that data for port has not been re-scaled to compensate for differences in radiating area.) (JBL Studio 150P Subwoofer)