

JMLab

Cobalt 806 Signature Loudspeakers



This well-regarded JMLab model started life in St Etienne, France, as the Cobalt 806 and was highly popular for several years before being re-invented in a slightly more expensive 'Signature' version, which is the one reviewed here. Now it seems JMLab has decided to retire the entire Cobalt series, which means it's the end of the line for the Cobalt 806S.

While this is sad news for those who admired the Cobalt 806S, which included yours truly, it's an ill wind that blows no good, because Audio Marketing, JMLab's Australian distributor, was offered the remaining stock-in-hand at a price it couldn't refuse. It's now not only taking its discount (30 per cent) from the previous retail price, but also doing the honourable thing by advising of the model's run-out status right up-front.

But is it a good idea to buy a run-out model? In this case, I'd have to say that it is, because I can't see a downside. The Cobalt 806S is a highly evolved bookshelf model that has been selling well for many years and has been well-reviewed right

around the world, and JMLab is a highly reputable French manufacturer that keeps replacement parts in stock, should they ever be required.

All you have to decide is whether you like how they sound!

The Equipment

The Cobalt 806S uses technology that's filtered down from JMLab's higher-priced speakers, in particular from the Utopia and Electra ranges. JMLab can do this because unlike the vast majority of loudspeaker manufacturers, it actually builds all its own drivers in its own factories in France. That's why you don't see too many tweeters like the unusual inverted (concave) Tioxid dome that's in the 806S. (And if you do, you can be assured that it's made by JMLab, no matter what brand-name is on the front baffle!).

JMLab has been championing this concave dome geometry for many years. The important point to note is that the tweeter isn't just a 'backwards' version of a conventional convex dome. In a

convex-domed tweeter, the voice coil is attached to the circumference of the dome, right alongside the suspension. This means that as the voice coil drives outwards, into the room, the soft material of the dome tends to lag behind, with the effect increasing towards the centre of the dome, which is the furthest away from the voice coil and has the greatest 'impedance' with the air.

In JMLab's concave dome design, the voice coil is attached halfway along the dome, which reduces any 'lag' by 50 per cent. However—and more importantly—the concave dome cannot 'collapse' under air pressure as it moves outward. But can it collapse as it moves 'backwards' into the loudspeaker? Sure, but in this case, because of the small volume of air behind the dome, there's a partial vacuum created when the dome moves out, so there's not as much air to push out of the way on the return trip, so performance is improved here also. The dome material is Tioxid 5 (originally introduced on the Grand Utopia) which is both stiffer

Brand: JMLab
Model: Cobalt 806S
Category: Bookshelf Loudspeakers
RRP: \$1699 (Currently \$1199)
Warranty: Five Years
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Guess what happens when you drive a rigid, ultra-lightweight cone with a huge motor system? You guessed it... you get lots of bass

and lighter than the original Tioxid, with improved damping. As you've probably guessed, 'Tioxid' is French for Titanium Oxide, and in the case of the 806s tweeter, the oxide layer is just 5 microns thick.

The Cobalt 806S' bass/midrange driver is 165mm in diameter, and has a triple-layer 'W' cone. The outer layers of the cone are both fibreglass, but of different types, while the inner layer is a lightweight foam material. In principle, the construction is very like that of a surfboard. (JMLab calls this a 'W' cone because the French word for 'glass' is 'verre', and the letters VV [Verre-Verre] resemble the letter W. I have always thought this was a rotten acronym, but I guess you couldn't pronounce 'VFF' in either French or English!). Although it's rated at 165mm, the Theile-Small diameter is 133mm for an effective cone area (ECA) of 139cm². JMLab claims its 'W' cones are lighter and stiffer than cones made from either paper or polypropylene, enabling superior performance. The driver chassis is cast from alloy and supports an absolutely gigantic magnet (which, in case you were thinking of using these speakers in a home theatre system, you should note is completely unshielded).

Look around the back of the Cobalt 806S and you'll get a real surprise because fixed into the rear panel is a small window through which you can see the crossover network. This being the case you won't need me to tell you it comprises four inductors, five high-quality polypropylene capacitors and a pair of cermet resistors. I have no idea why JMLab has done this, except that maybe the company is trying to make a point that its crossovers are well made,

using high-quality components, and that the crossovers made by its competitors aren't. What I do know is that although JMLab uses very high-order filters (36dB/octave), it claims perfect phase control and optimum dispersion through the crossover point (2.5kHz), which it promotes as proprietary 'OPC' (Optimum Phase Control) technology.

You can see from our product shot that the speaker is a bass-reflex design, because of the port on the front. Each cabinet measures 220 x 385 x 278mm (WHD) and weighs 8.8kg.

Listening Sessions

Guess what happens when you drive a rigid, ultra-lightweight cone with a huge motor system? You guessed it... you get lots of bass, and in this case, the bottom end is 'trim, taut and terrific', as they say in Weight-Watchers sessions (not that I'd know), or 'fast, tuneful and deep' as they say in audio club listening sessions. It's rare that you experience this level of bass from a bookshelf speaker. Even more rare, the bass was clean even at high volume, and capable of delivering considerable punch right down into the bottom-most musical octave.


I thought the Cobalt 806S' midrange was a little laid-back but at the same time so superbly detailed and articulate that it gave the midrange a sense of fluidity and smoothness that more than compensated for the tiny lack of presence. Vocals were rendered beautifully, particularly those from female vocalists, whose intonation was balanced and true right through the spectrum. So far as male vocalists were concerned, I thought tenors and baritones were reproduced at the same high standard as females, but basses benefited from a little 'lift' in the depth of their



lower notes that I'm sure they would have appreciated if it happened in real life.

Initially, I found that the high frequencies punched through the mix relatively 'hot', so that cymbals and fancy brushwork in particular were often quite a bit forward and a little 'tizzy', but as I became familiar with this spectral balance, I rapidly attuned to it, so it became the norm. It was only after a couple of days that I realised that as usual, I'd hadn't fitted the speaker grilles and that in this case, because the Cobalt grilles are made from perforated steel, rather than the usual cloth, the extra punch I was hearing was engineered in specifically to compensate for the loss of level incurred as the sound went through the grille. Mentally kicking myself, I recovered the grilles from the packaging and, after fitting them, found the midrange/high-frequency balance 'miraculously' restored to what I'd say was a natural balance. I would, however, recommend aiming these speakers quite precisely at the listening position.

Conclusion

I'm told that if this review piques your interest you'll need to phone your nearest JMLab dealer fast, because stocks are limited, so this will be—quite literally—your last chance to own a pair of genuine JMLab Cobalt 806 Signatures. I reckon they're a bargain! 

James Ross

Readers interested in a full technical appraisal of the performance of the JMLab Cobalt 806S Loudspeakers should continue on and read the LABORATORY REPORT published on the following pages. All 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.

Test Results


The JMLab Cobalt 806S gave a generally good account of itself, with *Australian HI-FI Test Laboratories* measuring the frequency response, with a pink noise test stimulus, as extending from 70Hz to 25kHz ± 2.5 dB. As you can see from the graph (*Figure 1*), the response is not linear, despite falling within a very tight tolerance, and well within specification. Overall, the response rises above the arbitrary reference level (the 80dB line) between 100Hz and 400Hz (peaking at +2.5dB at around 150Hz), falls below reference between 700Hz and 3kHz (the minimum dip is -2.5dB at 1.8kHz), rises above reference again between 3.5kHz and 10kHz (though only by 1dB or so) then above 10kHz, it falls slowly with increasing frequency to be down 2.5dB at 25kHz. This puts the midrange level down around 4–5dB when compared to the level of bass and treble in the most musically significant areas of the spectrum.

Figure 2 shows the high-frequency performance of the Cobalt 806S with a gated sine test stimulus that mimics the response you'd get from an anechoic chamber. This shows the response above 10kHz is extraordinarily flat, indicating that the pink noise signal used in *Figure 1* was stressing the tweeter a little (heating it up), and that the tweeter's response must roll off rapidly above 30kHz. It's the high-frequency response that's graphed in *Figure 2* that's the response you should expect to hear in a typical lounge room, when listening to music. The very slight dip at 2.5kHz is likely an artefact of the crossover and the microphone position, since the crossover point is at 2.5kHz, but you can see that the average output level above 2.5kHz is still higher than the average level below this frequency. [Editor's Note: It subsequently transpired that *Australian HI-FI Test Laboratories* had measured the JMLab speaker without its grille. Had the grille been in place when the speakers were measured, this graphed level would be 1–2dB lower.]

The third graph in the set shows the low-frequency performance, measured using the usual near-field technique, with its attendant high-frequency limitations. (As usual, ignore the blip on the graph just below 50Hz, which is an artefact of the test process.) Taking the output of the

port first, you can see that it has a very low Q indeed, with the output almost dead-flat between 30Hz and 80Hz, then rolling off slowly above this point. There's considerable leakage of sound through the port at 1kHz, as you can see from the peak in the output, but note that in fact, the actual audible level would be much lower, since the two traces have not been compensated for differences in area, which would see the port's output lower down the graph in real terms, and since the nearfield measurement process on the driver is not accurate up at 1kHz, the driver's response would be much 'higher' up the graph in relative terms. Still, given that the 1kHz output through the port is only 9–10dB below its output below 100Hz, it's something JMLab could think about addressing.

The impedance graph (*Figure 4*) shows evidence of extensive 'frequency tailoring' and the very low impedance (close to 3 Ω) between 150–200Hz means this speaker would be best-partnered with an amplifier that has a high-quality output stage capable of easily driving 4 Ω loads without activating current-limiting. The peak in the response at 75Hz shows you shouldn't expect too much output below this frequency, though as you can see from *Figure 1*, the response rolls off very smoothly below 100Hz (at about 6dB per octave), so there's still appreciable output at 45–50Hz. The glitch just above 20kHz indicates some form of minor resonance, probably in the chamber behind the tweeter dome, but it's only of academic interest, not having any effect on the frequency response graphed in *Figure 1*. The matching between the left and right channels is very good indeed, though perhaps not quite as good as I might have hoped from a manufacturer of JMLabs' calibre.

Australian HI-FI Test Laboratories measured output at 88dB SPL at one metre for an equivalent 2.83V input, which I thought was absolutely first-rate for a relatively small two-way loudspeaker—though I note that it's fully 2dB lower than claimed by JMLab—so you won't need an overly powerful amplifier to drive the Cobalt 806S speakers, just good current delivery, as noted earlier. 

Steve Holding

YBA



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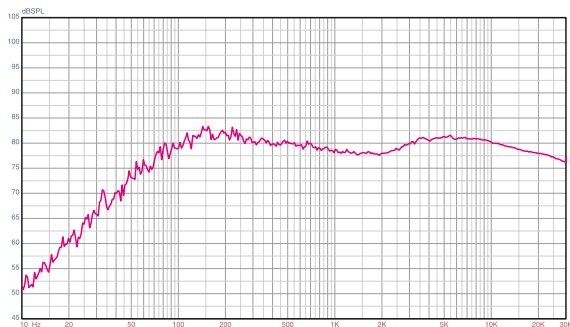


Figure 1: Pink noise frequency response (unsmoothed) at one watt at 1.5 metres.

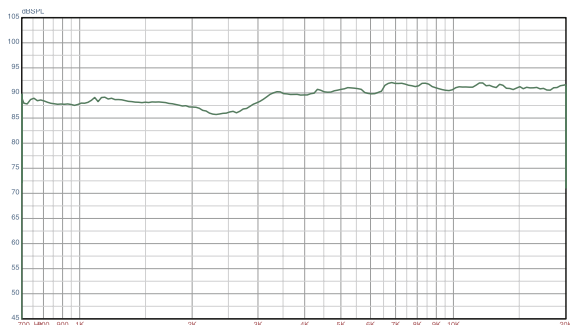


Figure 2: Gated sine frequency response (unsmoothed) at one watt, at 1.5 metres. (Without grille: see copy.)

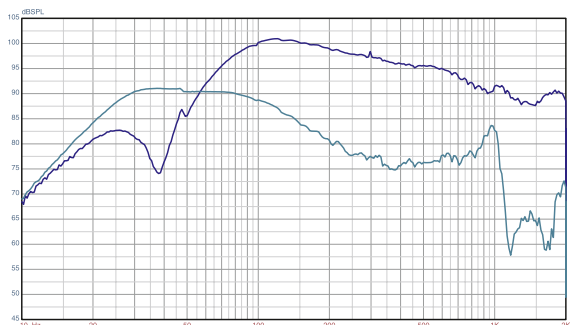


Figure 3: Nearfield frequency response of both bass drivers and reflex port. (Note data for ports has not been re-scaled to compensate for differences in radiating area.)

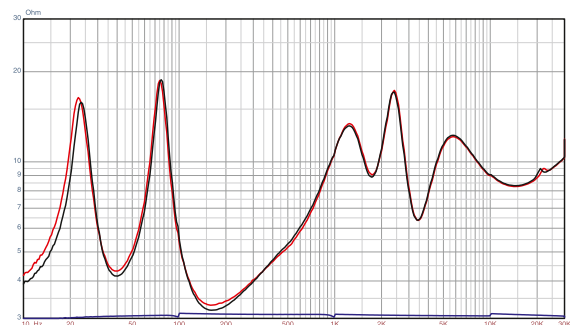


Figure 4: Impedance vs frequency, with both left and right speakers graphed (see copy). Trace under is that of a reference 3Ω precision resistor, measured at the same time for calibration purposes.



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