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Jamesloudspeaker EMB-1000 Subwoofer



The EMB-1000 is a tiny compact cube that features a design technique James Loudspeaker calls Energy Multiplied Bandpass. Most subwoofer manufacturers put a 10" or 12" cone in a box, either sealed or ported, and call it a day. By contrast, the EMB-1000 employs an unusual design that features a second 10" woofer hidden inside the cabinet behind the 10" woofer you see. This internal woofer is driven by the subwoofer’s integral amplifier; then the internal woofer’s acoustic output is acoustically coupled to the passive external woofer to produce sound.

To understand the advantage of this unusual approach, you need to know that the lower the frequency a woofer is producing, the farther the woofer’s cone must move. For example, a woofer must move 16 times farther at 25Hz than at 100Hz to produce the same sound-pressure level. Such high excursion creates distortion as the woofer’s voice coil moves out of the magnetic gap, making its movement non-linear. In other words, as frequency decreases, distortion increases.

Now back to James’ dual-woofer system. The external passive woofer is not driven by an electrical signal but by air compression in the chamber between it and the driven woofer behind it. The passive woofer’s resonant frequency is 35Hz, which causes its acoustic output to rise by 12.5dB at that frequency. To maintain flat response, the signal driving the internal woofer is equalized with a 12.5dB dip at 35Hz, which perfectly complements the passive woofer’s resonant peak to achieve flat response. Because of this equalization dip in the signal driving the internal woofer, the woofer isn’t driven as hard in the low frequencies, lowering its excursion and, with it, distortion. In this scheme, the driven woofer moves only about one-tenth as far at 35Hz as it would in conventional system. The passive driver, which doesn’t have a voice coil and magnet structure, moves much farther than the internal driven woofer (thus the "multiplying" factor claimed in the technique’s name). The result is lower distortion, greater output in the band where bass energy is concentrated, and increased dynamic headroom.





So how does Energy Multiplied Bandpass sound?

I'll cut to the chase: I was absolutely floored by the EMB1000's performance on both music and film soundtracks. With film, the EMB1000 easily reproduced the most difficult subwoofer torture test I know of: Chapter 17 of the DTS-ES version of *The Haunting*. This passage, which contains the highest-level/lowest-frequency energy of any DVD I've heard, quickly identifies subwoofers lacking in amplifier power or driver excursion.

But even when this chapter was played at calibrated THX Reference Level, the EMB1000 showed no sign of strain. The bass stayed clean, tight, and deep, with no spurious noises that would indicate the woofer was in trouble. The EMB-1000 also had an explosive dynamic quality that made effects sound quicker and more immediate. This quality, coupled with the EMB-1000's lack of the constant low-frequency drone one often hears from subs, made effects more like punctuation in the soundtrack-which is what the filmmakers intended.

On music, the EMB-1000 had remarkable agility, transient fidelity, and a complete lack of the boomy overhang and one-note monotony that so often passes for bass these days. With my main speakers set to "small" so that the EMB-1000 reproduced all the bass in the system, this little sub reproduced kick drum with astonishing authority and impact. Moreover, the EMB-1000 correctly reproduced the relationship between bass guitar and kick drum, which work together synergistically to drive the rhythm. The kick drum's dynamic envelope jumped out from the mix, adding to the rhythmic drive. The EMB-1000 even blended well with Wilson Audio's Sophia loudspeakers, creating a seamless integration between the bass and midbass. Check out Dave Holland's acoustic bass on the DVD *DeJohnette, Hancock, Holland, Metheny in Concert* to hear not only how musical and agile the EMB-1000 is but to get an idea of the tremendous dynamic impact and transient fidelity the sub delivers as it accurately follows Jack DeJohnette's masterful kick-drum work.

I'm always skeptical of "breakthrough" technologies that are more often than not invented by the company's marketing department rather than by its engineers. (The EMB-1000 was designed by a famous and revered engineer who must remain nameless.) In the case of the James EMB-1000, the theory is sound and the execution proves that a tiny compact cube can deliver not only the sheer bass output and dynamics of a much larger woofer but also beat larger systems in tonal accuracy, clarity, pitch articulation, and transient fidelity. The James EMB-1000 is a flat-out great subwoofer by any measure; that it costs \$1500 and is roughly a cubic foot in size is mind-blowing.

Price: \$1495 in granite; \$1795 in gloss black
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Reviewed by Robert Harley