

“Paradigm’s Perfect Bass Kit ...

AUDIBLY BETTER BASS

THROUGH SCIENCE.”

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by Chris Martens

Thousands upon thousands of words have been written to provide advice on subwoofer setup and placement, yet the fact remains that neither subwoofers nor the rooms we put them in are completely ideal, and the quality of the bass we hear suffers as a result. For this reason, wise subwoofer manufacturers have come up with EQ systems that at least partially take the room/subwoofer/listening position interface into account, and compensate accordingly.

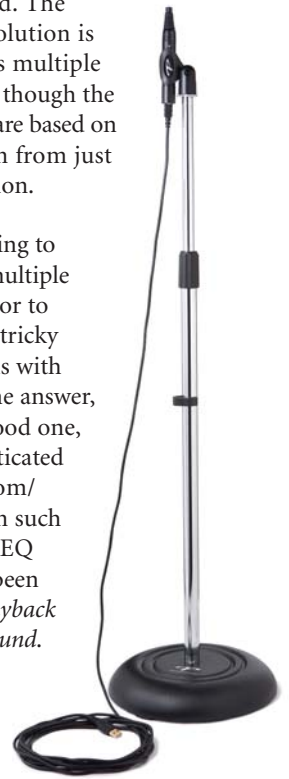
Two examples would be the Infinity RABOS (Room Acoustic Boundary Optimization System) or the JL Audio ARO (Automatic Room Optimization) system. In both cases, the general idea is to take bass measurements from a central listening location, to identify the dominant resonant mode adversely affecting sound at the listening position, and then to plot an EQ curve that compensates for that one dominant problem. Both these solutions can greatly improve bass, but their limitation is that they’re designed to fix just one relatively large-scale problem—not to address multiple peaks and troughs in the subwoofer’s in-room response curve.

Another, arguably more sophisticated, solution is the Velodyne Digital Drive EQ system that is built into the firm’s more ambitious subwoofers, and also offered in the form of an outboard bass EQ box called the SMS-1 EQ system. Either way, the game plan is again to take measurements from a central listening position, and then to apply a DSP-controlled, 8-band parametric equalizer to compensate for whatever

problems are found. The advantage of this solution is that it does address multiple peaks and troughs, though the adjustments made are based on measurements taken from just one listening position.

But what about trying to optimize bass for multiple listening locations, or to address potentially tricky standing waves? One answer, and a potentially good one, is to apply a sophisticated “whole system” room/speaker EQ solution such as Audyssey’s MultEQ system, which has been covered both in *Playback* and *The Absolute Sound*. In the Audyssey system, which is typically offered as a built-in feature in AVR’s or A/V controllers, but is also offered in a standalone EQ box, multiple sets of measurements are taken from multiple listening locations, and then fuzzy logic-based algorithms are applied to calculate individual EQ/time alignment curves for every speaker in the system—the subwoofer included.

That last statement (regarding “every speaker in the system”) describes what may be the Audyssey system’s greatest strength—and



biggest weakness, at least for some listeners. The fact is that many audio purists can embrace the idea of EQ for subwoofers, but are extremely reluctant (perhaps with good reason) to apply EQ that will affect the sound of their carefully chosen main, center channel, and surround speakers.

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All of this brings us to the fascinating solution offered by Paradigm in the form of its new **PBK-1 Perfect Bass Kit**, which works with a number of new Paradigm subs, including the Sub 12 and Sub 15 described in a recent *AVguide.com* news post. For my part, I became familiar with the Sub 12 and the PBK-1 kit over the course of testing Paradigm’s new Studio 60 surround speaker system, which I’m reviewing in the upcoming *Playback* Issue 18. But now lets focus on what the PBK-1 kit is and does.

The PBK-1 kit includes a mic stand, a USB mic with cables, a USB cable that plugs into the back of select Paradigm subwoofers, and a software and device driver package that must be loaded on a laptop PC. Here’s how the kit works.

You begin by connecting both the mic and the sub to USB ports on your laptop. Then, after installing the PBK-1 software and drivers on the laptop, a testing process begins. The

software prompts you to place the mic in the most central listening position (Position 1) with the mic at ear level and pointed straight up toward the ceiling. Once the mic is set, you click a prompt to start the tests. The computer issues a series of pulsed sweep-tone signals that are played by the sub while the mic captures the results (which are stored on the computer). The whole process takes just a few seconds. After the process is finished for Position 1, the software prompts you to move the mic to another location, preferably one that is to the left or right of Position 1 by at least 2 feet, with the mic again placed at ear level. You then repeat the measurement process for mic Positions 2, 3, 4, etc. until you have gathered test data from between 5-10 listening locations (PBK-1 kit instructions advise that, for best results, you must take measurements from a minimum of 5 mic locations).

“The whole process takes less than 5 minutes from beginning to end.”

Once the final set of measurements is taken, you initiate a computational process where your PC number crunches for a while to analyze your in-room measurements and then calculate an ideal EQ curve for your sub. One benefit of the PBK-1 system is that it calculates extremely precise EQ curves, by leveraging the superior processing power of a full-on laptop (as compared to the smaller, less capable processors typically included in AVR’s or other audio components). When the calculations are complete, the laptop displays a graph showing the “before” response curve of the sub, a “target curve” that defines optimal subwoofer performance, and a projected “results” curve that shows how the sub should perform once the newly-calculated response curve is applied. The EQ curve is downloaded to the sub, and you’re given the option of saving a copy for future use. The whole process takes less than 5 minutes from beginning to end.

“... purists please take note, [PBK-1] affects only the subwoofer—not the other speakers in your system.”

Several noteworthy features of the software are its ability to correct multiple peaks and/or troughs in the subwoofer/room bass response curve, to identify and address potential standing wave problems, to calculate a solution that helps optimize bass response across multiple listening locations, and that, purists please take note, affects only the subwoofer—not the other speakers in your system.

Does it really work? You bet it does! I did some listening tests with the Paradigm Sub 12 before using the PBK-1 kit and then afterwards, and I can vouch for the fact that the PBK-1-equalized sub sounded much tighter, more neutrally voiced, and much better defined. In short, Paradigm’s PBK-1 package is an all gain/(almost) no pain system that gives you audibly better bass through science.

PARADIGM PERFECT BASS KIT™ IS DESIGNED FOR USE WITH:

- Paradigm Reference Signature SUB 25, SUB 1, SUB 2
- Paradigm Reference SUB 12, SUB 15, RVC-12SQ
- Paradigm DSP and UltraCube™ Subwoofers
- Paradigm Special Edition (SE) Subwoofer