Electronic bass trap uses feedback control techniques for reducing the boominess of sound at frequencies corresponding to offending (coloring) standing waves of a room. These controllers can be tuned to a single (or multiple) resonant bass modes and abate sound coloration at those resonant frequencies. Figure 2 shows the acoustic frequency response of a small room with and without the electronic bass trap system. The room is rectangular shape with the longest dimension (length) of 172 inches, having a dominant coloration due to the 38 Hz standing wave that shapes up along the length of the room. Clear from Figure 2, the electronic bass trap, which was tuned to the frequency of the first standing wave, has effectively reduced the coloration due to that mode.

In addition to being tunable, the electronic bass trap is highly reliable, robust, cost-effective and small in size (practically the size of a subwoofer).

The key selling points of this product are: 1) smaller size than traditional passive bass traps, 2) customization of the product to an individual room and the ability to be re-customized to another room, and 3) the innovative internet based service to customize the product to an individual room.

Electronic bass trap is a patent-pending, feedback control scheme incorporated into an active subwoofer. This bass acoustic damping/absorption scheme is developed at DEICON, Inc. It abates the low-frequency coloration in listening rooms, home theaters, and recording/broadcasting studios. This product is tuned to the individual acoustics of customer's listening/recording environment. It can either be a stand-alone system used to add lowfrequency absorption to the acoustics of a room, e.g. in a recording studio, or designed into the sound system's subwoofer, e.g. in a listening room. DEICON, Inc. has also developed an innovative, internet-based approach to assist buyers tune the product to their particular listening/recording environments.

In terms of required hardware, in addition to a powered subwoofer, the electronic bass trap needs only a low-cost microphone and an op-amp circuit or a micro-controller (which will house the control algorithm). The additional cost of incorporating the electronic bass trap into a subwoofer (for lowering the coloration due to the lowfrequency standing waves) over a traditional powered subwoofer is minimal.

Figure 1. ASC's Tube Trap™ installed in a listening room (dashed line/blue)

Figure 2. Frequency response functions with the controller on (solid line/red) and off