

# Linkwitz Transform Closed-Box and Vented-Box Tutorial

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## Abstract

Conventional wisdom states that the Linkwitz Transform technique can only be applied to closed-box ( $2^{nd}$ -order) woofers. This document presents a procedure to extend the technique to vented-box ( $4^{th}$ -order) woofers. Issues of excessive low-frequency cone excursion are discussed, and methods for reduction of low-frequency excursion by extension of the technique to higher-order filters are developed. Use of the technique to modify a natural woofer response to a more desirable alignment is described. Application of the technique for incorporation of a natural woofer response into a crossover highpass filter is also presented.

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