VENTED BOX BASS SPEAKERS AND HORN TREBLE SYSTEMS

Back in 1957 I undertook to design a "vented box" loudspeaker. The work was "cut and try", because the work of Neville Thiele had not yet penetrated the acoustics literature of the United States. His 1961 paper "Loudspeakers in Vented Boxes", Proc. IRE (Australia) was reprinted in the Journal of Audio Eng. Soc. in 1971. Our first experimental model and all subsequent models used horn midrange and tweeter speakers.

Dick Moore, an engineer formerly with KLIPSCH AND ASSOCIATES, INC., and later Don Keele, currently with this company, have gone over the design of our CORNWALL® Speaker and found it to be within a few percent of a Thiele B-3 alignment.

Most of the work of R. H. Small and others working on the Thiele designs have been more concerned with the amplitude vs. frequency response than with distortion. My work was largely directed to minimum distortion. From the results, it appears the B-3 alignment offers the lowest distortion among vented box alignments.

Reviewing our designs from time to time is a habit with us, and the CORNWALL has been reevaluated. The first such review took place, not to improve the existing performance, but to rearrange the structure to put the port on the same face (in front) as the driver unit. Since then, each review has resulted in the conclusion "Don't Change Anything". Well, actually, we have changed bass drivers several times with measurable improvement. In 1963 we adopted a new midrange horn and driver that amounted to a significant improvement. But our 1960 vented box bass systems would compare favorably with our current 1977 speakers.

This brings us to what really sets our CORNWALL apart from (perhaps) all other vented boxes.

The midrange is "where we live"; this is the frequency range where the ear is most sensitive to both tonal anomalies and to distortion. From the beginning of our company we have used horn-type midrange in all our speakers, because we can achieve a smoother amplitude response as well as an order of magnitude lower distortion. This applies to all our speakers from our HERESY and CORNWALL on up through our LA SCALA, BELLE KLIPSCH, and KLIPSCHORN.

You may wonder why we do not use a 2-inch direct radiator midrange and a 1-inch "D.R." tweeter. There are cogent reasons: they won't handle adequate power except at high distortion. One could go to larger sizes, or a plurality of units, but the power output capacity would increase only slightly, and the polar response (dispersion pattern) would look like the spokes of a wheel. The only way to accomplish the treble performance we wanted was with our horns. My papers on MODULATION DISTOR-
TION show that horns display one to three orders of magnitude lower distortion than direct radiators at the same power output level.

When you use our CORNWALL, you are using the best ported box bass speaker available, plus the best, lowest distortion, and most nearly “flat response” treble available at any price. We use the same midrange driver and the same tweeter in all our speakers from our HERESY to our KLIPSCHORN.

PAUL W. KLIPSCH