Canadian Audiologist
The Official Publication of the Canadian Academy of Audiology

CORFIG and GIFROC: Real Ear to Coupler and Back

Published November 12th, 2025

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>
> In Acoustical Factors Affecting Hearing Aid Performance, (2nd edition), Studebaker, G.A., and Hochberg, I. (eds.) University Park Press, 65-86., 1993.

SOMETHING ABOUT MEAD

The 1980 Killion and Monser chapter, “Coupler response for flat insertion gain”,* presented Mead’s groundbreaking concept of transforming a desired real-ear insertion-gain response to an estimate of the 2-cc coupler response of a hearing aid expected to achieve that real-ear response. This 2nd edition of the chapter takes the concept further, adding that an estimate of the real-ear insertion gain can be made by applying the CORFIG transformation in inverse (GIFROC) to the known coupler response. Importantly, these transforms have been upgraded to include the individual difference from average in the real-ear-to-coupler difference (RECD??), which has become an essential part of today’s most accurate real-ear-based fitting protocols.

??Note: During the co-writing of the chapter, I had proposed calling the real-ear-to-coupler difference the “real-ear volume impedance transformation,” or “REVIT.” … Obviously that never got off the ground.

SUMMARY

The acronym “CORFIG,” as used to describe the transformation that predicts the *2-cc coupler* response a hearing aid should have to provide a given insertion response, has gained some acceptance since the original version of this chapter was written 10 years ago. Whether or not its arithmetic inverse, “GIFROC,” will gain similar acceptance remains to be seen. Still, the basic utility of the transformation from real-ear to 2-cc coupler measurements (and vice versa) is well established. …We are now at the point where the first-order corrections are well known, and it is possible to concentrate on second-order effects and refinements.

Annotator’s Note: If a third edition of this chapter were possible, I would wish to include a now-proven theorem** that the real-ear unaided response (REUR) should not be used in insertion gain prescriptions and evaluations unless sound-field thresholds were used to obtain the unaided thresholds. In earphone thresholds, the average-ear unaided response should be substituted in a real-ear insertion-gain evaluation to achieve the desired aided sound-field thresholds.

**For a mathematical proof of the above theorem, see:

Revit, L. J. (2002). Real-ear measures. In M. Valente (Ed.), *Strategies for Selecting and Verifying Hearing Aid Fittings, 2nd Edition*. New York, NY: Thieme, Appendix: pp. 120-122.

*See also *Killion MC and Monser EL (1980) “CORFIG: Coupler response for flat insertion gain,” Chapter 8 in Acoustical Factors Affecting Hearing Aid Performance, Studebaker GA and Hochberg I, eds. (University Park Press, Baltimore)

> Annotated by: Larry Revit