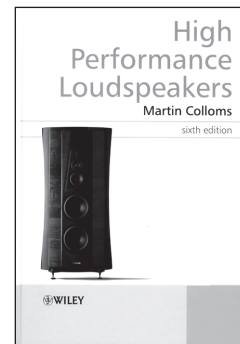




Book Review:

High Performance Loudspeakers By Martin Colloms (6th Edition)

Reviewed By Dennis Colin



What weighs 2 lbs, has a volume of 1.5 ltrs, and 226ft³ of area, and contains virtually all the information you need to know about the principles, practice, construction, design, and history of just about every type of loudspeaker system and driver? This book, that's what.

It presents only basic math, when appropriate. It is not, nor is it meant to be, an acoustical physics textbook, but those principles are well explained when necessary.

It is beyond the scope of this brief review to comprehensively cover the wealth of material presented, but I present the table of contents on the *aX* website, www.audioXpress.com.

The book begins (after the preface) with a parameter notation list, then a glossary of acoustic, speaker, and audiologic terms (examples: angular velocity, core shear, cysoid, quasi-periodic, specific acoustic impedance). "Cysoid" is a new one to me: "sinusoid of arbitrary frequency and phase that forms one frequency component of a general signal." So, you can impress your friends by saying "my stereo system can resolve 300,000 cysoids in a three minute song!"

Many speaker designs are shown in detail, but this is not a cookbook: A cookbook gives you many fish to eat (as the parable goes), but this teaches you not only how to "fish," but also what kind of "fish" (speaker designs) would best satisfy your tastes, room environment, and budget.

The writing is excellent, presenting even complex issues without "losing" the reader. While equations are shown, the principles are demonstrated with design

examples, "rules of thumb," and superb illustrations and photographs.

A VERY SMALL SAMPLE OF TOPICS

—"Polar response of . . . driver." Excellent computer illustration of dispersed wavefronts (p. 40, Fig. 2.17).

—Celestion laser scan of concentric bending resonance (p. 67, Fig. 3.9).

—"Effect of sealing an open fabric dustcap . . . (after *Speaker Builder*)." How about that—this one-volume encyclopedia mentions us (p. 237, Fig. 5.12)!

—Instability and "jump-out" of cone due to flux nonlinearity. (and some believe that a passive system can't oscillate!)(pp. 78-79).

—"Subjective Effect of Bass Driver Suspension Hysteresis: Pace and Rhythm." **Comment:** When some reviewers refer to "pace and rhythm," I (correctly) object on the purely technical grounds that no speaker can alter the rhythmic rate of music (unless the speaker is moving regarding the listener at a sizable fraction of the speed of sound, 769mph!). But Mr. Colloms mentions that one's *perception* of rhythmic timing is influenced by "the kind of low colouration performance and uniformity that was originally only sought and expected from the mid-range of high-quality speaker systems"(p. 221).

—A "surprise alignment"—a 50 ltr (only 1.8ft³) vented box that's -3dB at 48Hz, but only -6dB at 31Hz, "approximating to 6dB/octave, quite unlike the usual expectation for a reflex design. In fact, the slope remains less than 12dB/octave right down to 18Hz"(pp. 166, 168, Fig. 4.28).

—Three-dimensional energy plots (p.

277, Fig. 6.13).

—Distortion spectra of various iron-core inductors (pp. 308-310).

—Equations for, and 3D illustrations of, enclosure resonances (pp. 364-368).

—Sound absorption versus frequency, after *Speaker Builder* (p. 379, Fig. 7.10).

—"Colouration": a chart relating subjective impressions to approximate frequency range; e.g., "Boomy = 50-80Hz; chesty = 100-150Hz; tubelike, tunneled = 400-600Hz; nasal, hard = 1.8-2.5kHz; sharp, metallic, sibilant = 5-8kHz; fizzy, gritty = 10-15kHz"(p. 507, Table 9.6).

The book's first sentences are "Speech and music are noise with meaning. The recording and reproducing of sound is imperfect; the process reduces meaning and adds noise."

The last sentence (p. 520) is "A useful directory of software, hardware, and references may be found at www.harmony-central.com/other/speakerfaq."

Everything in between is informative, interesting, useful, practical yet thoroughly described, and superbly illustrated. No beginner will find this book too difficult, and no expert can afford not to read it.

Then again, John Wiley and Sons, Ltd. publish only the very best technical literature. (And despite this glowing review, I have no affiliation, agenda, or relationship with them or the author.)

OK, I admit it—an alien from the Andromeda Galaxy paid me 3.14 billion Protonoids! *aX*

(Available from Old Colony Sound Lab, PO Box 876, Peterborough, NH 03458, 1-888-924-9465, www.audioXpress.com)