

## **Can you suggest background reading on audio topics and speakers in particular?**

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The following is a list of publications on the subject of speaker design and audio in general, which may be of help if you can buy them or get them from your local library. Some are known to be out of print, but are still relevant. They vary in technicality from readable by the enthusiastic layman to serious university level.

“High Performance Loudspeakers” by Martin Colloms, published by Wiley. The 6th edition is due for publication in July 2005.

This is one of the best introductions to speaker design. A good overview without getting too mathematical.

“The Loudspeaker Design Cookbook” by Vance Dickason, published by Marshall Jones and Co, Francetown, New Hampshire USA.

This is absolutely excellent and directly available from:

The Old Colony Sound Lab, PO Box 243, Peterborough, New Hampshire, 03458-0243, USA or by order from your bookshop.

“Loudspeakers” Volumes I, II, III and IV - anthologies of papers published by the **Audio Engineering Society**.

These papers are a must for the professionals and contain several classic papers, including those of Neville Thiele and Richard Small (as in Thiele-Small parameters) on enclosure alignments. B&W is proud to be a sustaining member of the AES. If you are in the audio profession and not already a member of the AES, you should seriously consider joining.

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AES Inc, 60 East 42nd Street, Room 2520, New York, NY 10165-2520

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The Journal of the Audio Engineering Society (JAES) is the audio professionals' journal, and it may be available in your Local University Library. Other related, but not so relevant, journals are:

- Journal of the Acoustical Society of America (JASA)
- Journal of Sound and Vibration
- Acoustica
- Soviet Physics Acoustics and Acoustics Letters

“Loudspeakers - Theory, Performance, Testing and Design” by N W McLachlan, published by Dover Publications Inc.

This is quite old and now out of print, but it is an essential read for the serious designer. It's probably the only book to deal with dynamic rectification - the phenomenon of the centre position of the driver movement changing with frequency.

“Loudspeaker and Headphone Handbook” by John Borwick, published by Butterworth Press.

“Room Acoustics” by Kuttruff published by Applied Science.

“Loudspeaker Handbook” by J Eargle, published by Chapman Hall.

“Audio Engineers Reference book” by M Talbot Smith, published by Butterworth Press.

“Sound Recording Practice” by John Borwick published by Oxford Press.

Other books that may be of interest are:

“The Master Handbook of Acoustics” by F. Alton Everest

“Sound Studio Construction” by F Alton Everest

“Master Handbook for Sound Engineers”

“Introduction to Acoustics and Psychoacoustics” by Howard & Angus, published by Focal

“Studio Monitoring and Design” by Phillip Newell

“Guide to High End Audio” by Robert Harley

Other more technical books, which may only be in libraries now are:

“Fundamentals of Acoustics” by Kinsler and Frey, published by Wiley

“Acoustics” by L L Beranek, published by McGraw Hill and republished by Acoustical Society of America. A classic. Leo Beranek was one of the early audio pioneers. He has also written books on other fields of Acoustics such as industrial noise control and acoustical measurements.

“Acoustical Engineering” by H F Olson, published by Van Nostrand.

Another early standard work, but with one or two mathematical errors, notably the claim that vented-box systems roll off at 18dB/octave. Olsen thought up the passive radiator or drone cone as he called it, but look to Richard Small's papers for the definitive analysis. Read this book and you will realise just how many so-called new techniques are just old ideas refined or done properly - or sometimes just simply rehashed.

“Vibration and Sound” by Philip Morse, republished by the Acoustical Society of America.

“Theoretical Acoustics” by Morse and Ingard published by McGraw Hill, but now out of print.

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“Foundations of Acoustics” by E Skudrzyk - out of print and very theoretical.

“Origins in Acoustics” by Fred Hunt - a history of acoustics published by the Acoustical Society of America.

You might like to subscribe to the American “Speaker Builder” magazine. This is available from PO Box 494, Dept LD2, Peterborough, New Hampshire, NH 03458-0494, USA.

Computer software for modelling drive units and cabinets is very well known, with several commercially available packages (eg CALSOD, LEAP), and virtually every manufacturer has their own home-written packages. At low frequencies they tend to be based on lumped parameter equivalent circuit analysis and at high frequencies on finite element analysis.