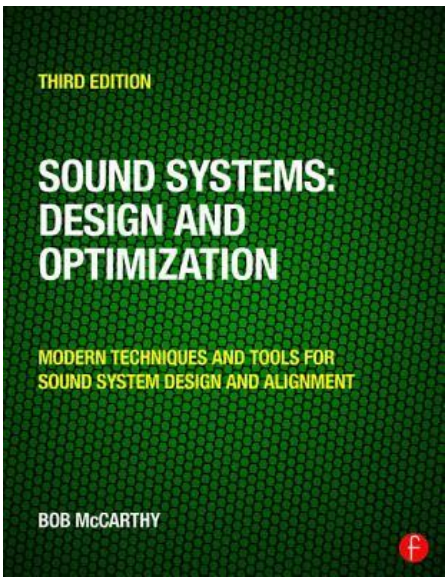

Sound Systems: Design and Optimization: Modern Techniques and Tools for Sound System Design and Alignment

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Sound Systems: Design and Optimization provides an accessible and unique perspective on the behavior of sound systems in the practical world. The third edition reflects current trends in the audio field thereby providing readers with the newest methodologies and techniques.

In this greatly expanded new edition, you'll find clearer explanations, a more streamlined organization, increased coverage of current technologies and comprehensive case studies of the author's award-winning work in the field.

As the only book devoted exclusively to modern tools and techniques in this emerging field, *Sound Systems: Design and Optimization* provides the specialized guidance needed to perfect your design skills. This book helps you:

Improve your design and optimization decisions by understanding how audiences perceive reinforced sound

Use modern analyzers and prediction programs to select speaker placement, equalization, delay and level settings based on how loudspeakers interact in the space

Define speaker array configurations and design strategies that maximize the potential for spatial uniformity

Gain a comprehensive understanding of the tools and techniques required to generate a design that will create a successful transmission/reception model

Sound Systems: Design and Optimization: Modern Techniques and Tools for Sound System Design and Alignment Details

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From Reader Review Sound Systems: Design and Optimization: Modern Techniques and Tools for Sound System Design and Alignment for online ebook

Nathan Lively says

It may sound like hyperbole, but I can divide my professional career pretty clearly by the time before I read this book and the time after. Before reading McCarthy's book I was using professional sound systems mainly by assumption, guessing, and what I had seen other people do. I was setting up stereo systems at every venue, measuring their performance with a stupid hand-held RTA, and optimizing with a single graphic EQ. Learning about how to apply the physics of sound to my work as an audio engineer changed my life. I don't always do the right thing now, but at least I have a better idea of what I'm doing.

Benjamin says

I'll always be "currently reading" this book: it teaches you just about everything you'd ever want to know about designing and optimizing a sound system. Questions about the physics of audio? The answers are here.

Nathan Lively says

I freely admit that I love this book. I've read Sound Systems: Design & Optimization cover to cover and use it as a reference on an ongoing basis. The first time I read the book, I was excited to learn that there are areas of audio that can be predicted and measured. It felt like all of a sudden invisible audio could be visualized and altered. Since then, I've felt a strong affinity for system tuning and have tried to bring it into my work whenever possible.

The upside of reading this book is that you learn a lot about topics you never knew existed but have been affecting your audio work this entire time. The downside is that you will want to change everything, and be frustrated when you can't. All of a sudden you will want to move speakers around and fly mono point-source clusters. You'll want to measure everything and play a lot of pink noise. You'll want to throw out your graphic EQ and RTA, but you will encounter resistance from producers, managers, owners, colleagues, and the clock. It is really hard to be so excited about this stuff and not be able to get your hands on it. Keep your eyes open and trust me, opportunities will start to present themselves.

Sound reinforcement is far from perfect. Speakers are "mechanical devices attempting to produce wavelengths that vary in size by a factor of over 600:1." Luckily measurement systems are affordable and we can set goals to get the most out of our imperfect systems. McCarthy is a realist, and his book is all about triage. Your patients will never be 100% injury-free, but you can apply pressure and stop bleeding from the major arteries.
Quote

"If the system is always operated safely within its linear range, there is no need for limiting. This could happen in our lifetime, as could world peace. But unfortunately, we have to assume the worst-case scenario:

that the sytem will be subjected to the maximum level of abuse fathomable, plus 6 dB." -Bob McCarthy

Introductory chapters walk you through terminology with a minimal amount of math and a constant connection to their necessity for the job at hand. This is not a simple read. There were many ideas and terms I had never heard before, as well as lots of tables and diagrams to interpret. This complexity is also what made the book so captivating. I couldn't beleive that there was so much about audio that I didn't know! McCarthy makes sure to keep you motivated by providing real-world applications like a carrot at the end of a stick.

"The premise of this text is minimal theoretical math and maximum field applicability." -Bob McCarthy

Pro Tip number one: This book is best read from start to finish. Later on you can use it as a reference manual, but if you try to start in the middle of a chapter without understanding the context you may be disappointed and confused. This isn't because you're dumb or the material is obtuse! Rather, our brains like to preserve energy, and when you present too many new ideas (including vocabulary) at once, they fight back and try to dissuade us from attempting to understand the material. That's why you don't always understand everything the first time you read it, but when you go back read it again the concepts become more clear. Pro Tip number two: also check out McCarthy's website for more real-life examples.

One thing that I love about McCarthy's style is that he crushes audio myths left and right, but does so gently and with good humor. It is kind of annoying to find out that I've been doing it wrong for the past ten years, but I don't feel attacked, just well-informed. For example, graphic EQs are really no good for system optimization because of their fixed bands, but I've used them for years because they were…available (see interview below at 24m24s). Also, designing a stereo system is usually a futile effort because only a small triangle of the audience will hear in stereo, but I did that for years because that's how recording studio systems are set up (see interview below at 28m54s).

http://www.sounddesignlive.com/sound-...

"The real-time analyzer (RTA) has a number of applications in which it is the best tool for system optimization: zero." -Bob McCarthy

Speaking of doing it wrong…back when I was starting out in theatre at the National Theatre of Portugal, they had a rack-mounted 32-band RTA. No one really knew how to use it, but look at those pretty LEDs bounce up and down! Later I bought my own handheld RTA. Man, it was cool. No one had ever seen one. I felt like a god over sound. I could take measurements in different locations of the room, average them together, and set my graphic EQ by the numbers. Solved. Why did I think this was the best tool for system optimization? From the manual and marketing materials for the RTA of course! Another win for marketing over science.

Back to the book! The section summaries and best-practice recommendations in the newest edition are super helpful. McCarthy makes a point to be unbiased and very specific in his writing, which is a breath of fresh air after audio literature that is full of useless generalizations that pander to quick answers. With the first edition of Sound Systems I would sometimes finish an entire chapter having learned many details on a subject and still not know where to start. Imagine a whole book about making pancakes that focuses on the food chemistry of eggs and flour. In contrast, the second edition of McCarthy's book includes some recipes at the end to get you started.

Pro Tip three: Take notes! This book contains a wealth of knowledge. As you read it, you will find specific pieces of information that pertain to your work. Write those down. I refer back to mine often, except I lost it

in a move a few years ago. I'm going digital this time!

One of the reasons that this book is so long is that McCarthy is genuinely trying to prepare us for any situation we might possibly encounter. I mean, it's 106 pages before "We are now ready to apply our study of summation and the acoustic crossover to the practical construction of speaker arrays." It does not provide solutions for specific scenarios; instead you'll have "a road map with milestones of what we should expect to find, and where." This is one of the rare occasions in life when stereotypes are good. Without them, the possibilities for design and optimization would be endless and nauseating. Armed with a set of geometrical tools, we can look at a design or a space and begin to narrow down our possible outcomes. No matter how complex the speaker array, it is still built on the basic foundations of physics.

I never thought that I was a geometry lover, but my favorite parts of this book are the sections on speaker coverage. No one speaker is a perfect fit for a room, so there is always opportunity for system design. Looking for help finding speaker coverage in a room? Check out my article Finding Speaker Coverage In One Step.

This is a challenging read, but completely worth the effort. McCarthy eases you into difficult physics concepts with great care and humor. Before you know it, you're swimming in the deepest waters of professional sound system design.

Really, though, you don't have to read this book to get great sound. You could just hire me to do it for you. ;)
