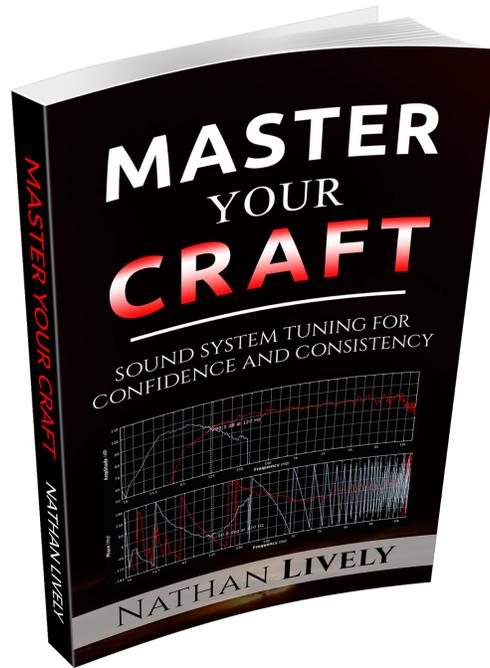


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Master Your Craft

By Nathan Lively

Cliffs Notes

Table of Contents

Chapter 1: The Sound System Tuning Opportunity	1
Chapter 2: What is Sound System Tuning?	2
Chapter 3: Is flat good or bad?	2
Chapter 4: Where do I put the measurement mic?	2
Chapter 5: Phase alignment—Subs/Mains	2
Chapter 6: Lessons on Sound System Design & Optimization with Bob McCarthy	3
Chapter 7: Sound System Design for Small Rooms with Bob McCarthy	3
Chapter 8: How To Tune A Sound System In 15 Minutes	4
Chapter 9: How To Find Speaker Coverage In One Step	4
Chapter 10: Six Smart, Proven Methods To Control Feedback On Stage (Without EQ)	4
Chapter 11: Rise of Sound System Tuning	5
Chapter 13: Sound System Tuning Resources	5

Chapter 1: The Sound System Tuning Opportunity

- System optimization cannot be fully automated. It requires a human perspective.
- Simply improving your mixing does not result in great results for the audience. You must consider the entire signal path from source to listener.
- Simple tools, like a polarity tester, can make a huge difference.
- Sound system tuning is not only for technicians and those who are scientifically inclined.
- Every sound system deserves the care and attention of optimization, not just big shows with big budgets.
- I take advantage of every tool available to me, rather than basing my career on golden ears.
- Audio is considered black magic because it is invisible and very personal.
- The information you gain from this book must be put into practice for it to turn into understanding.
- This book won't get you hired, but the consistent results that you deliver from night to night and seat to seat using the ideas shared here will.

Chapter 2: What is Sound System Tuning?

- Tuning a sound system involves objective goals and measurements.
 - Adjust for uniform response over the listening area.
 - Same sound everywhere.
- Toning a sound system is a subjective, artistic endeavor.
 - It's not a science, and we don't need to make it one.
- The audio analyzer is a tool to support your craft, not an automatic solution. You don't use it to make something sound good; you use it to make it sound the same everywhere.
- An RTA and graphic EQ are never appropriate for system tuning.

Chapter 3: Is flat good or bad?

- A perfectly flat measurement with 100% coherence is impossible.
- There is no one-size-fits-all frequency response curve. Instead, prioritize the biggest problems and treat those first.

Chapter 4: Where do I put the measurement mike?

- Multiple microphones is more efficient, but you can do it all with a single measurement microphone.
- One of the most important positions to measure is the place where one speaker hands over coverage to another.
- Align your subs to your mains at FOH to help the FOH mixer make clear decisions.

Chapter 5: Phase alignment—Subs/Mains

- Adjust delay or speaker placement while observing phase alignment at the spectral crossover frequency.

Chapter 6: Lessons on Sound System Design and Optimization with Bob McCarthy

Sound is difficult

- Graphic EQs are tone shaping tools, not system tuning tools.
- With left/right mains, have only a bit of overlap in the center to get the benefits of stereo with few of the deficits of overlap.
- Left/right subs will give you the nose of doom.
- Counteract the narrowing coverage of a line of subs by moving them into a physical or digital arc.
- We need time to focus our speakers, just like lighting and video engineers need time to focus their instruments.
- Silence is not necessary for sound system tuning.
- If you only have time for one test, test continuity.
- With system EQ, look for global trends over large areas.
- To find the on-axis point for a speaker or array, measure its near field response first, then try to match that trace in the far field.
- To splay two speakers in a point destination array, rotate them until the off-axis measurement in their middle measures 6 dB.
- If you fix somebody's sound system but you humiliate them in the process, you'll never work with them again.

Chapter 7: Sound System Design for Small Rooms with Bob McCarthy

- When measuring in high wind, focus on long-term trends.
- When you want to do loud music in a closed space, you really need to err on the side of drying up the room as much as possible.
- In the vertical plane, level is king. Adjusting relative timing using the precedence effect will only hold up for a few seats.
- Resign your subs to a mono configuration.
- To find speaker aim, partition the room into coverage zones for each speaker and aim through the middle of the middle.
- By the time you get two milliseconds or two feet apart in the arrival time between speakers, there is the possibility of comb filtering down to 250Hz.

Chapter 8: How To Tune A Sound System In 15 Minutes

1. Minutes 0-4: Driver Functionality & Polarity
2. Minutes 4-8: Speaker Aim & Splay
3. Minutes 8-10: Speaker Level & Crossover
4. Minutes 10-12: Phase & Delay
5. Minutes 12-15: Filter & EQ

Chapter 9: How To Find Speaker Coverage In One Step

- <http://sounddesignlive.com/how-to-find-speaker-coverage-calculator-daniel-lundberg/>
- In MAPP XT, you can use measurement microphones instead of architectural visual aids to find distances from speakers.
- A 50° speaker is only 50° at a range of frequencies. Consult product polar plots.
- A loudspeaker with a single woofer and a single horn is going to have asymmetric coverage around its crossover.
- Keep the distance ratio for each speaker element below 2:1.
- Tuning a sound system with U2 is like a projectionist focusing his screens with Star Wars.

Chapter 10: Six Smart, Proven Methods To Control Feedback On Stage (Without EQ)

- Method 0: Psychology—Be Proactive
- Method 1: Microphone Placement
 - Use close miking.
 - Don't cup the mike.
 - Aim the microphone's null point at the stage monitor.
- Method 2: Speaker Placement
 - Place stage monitors close to their performers.
 - Place and aim house speakers so that they are not covering the stage.
- Method 3: Instrument/Source Placement
 - Move vocalists away from the drums.
 - Use a drum shield.
 - Place guitar amps up high near the player's head.
- Method 4: Mix
 - Stage Monitor: only include the essentials.

- FOH: in small venues, start with the vocals.
- Method 5: The Holy Grail
 - IEMs, e-drums, synths. Done! ;)
- Method 6: Don't Give A Fuck
 - “These setups that we're working on, there's EQs everywhere. If there's still feedback, it's too loud. So lower it or let it ring all night. I don't give a fuck.”
—Dimitris Sotiropoulos
- #ObligatoryBonus: EQ
 - Cut as much low end as possible.
- Other Tricks To Try
 - Feedback Eliminator
 - Frequency Training
 - Microphone Slitter

Chapter 11: Rise of Sound System Tuning

- Audio entrepreneurs to come will truly care more about how every audience member experiences the show than about how they experience it themselves, and they will use these ideas to make better events for all of us.
- There will always be the lucky few who are in the right place at the right time to receive the right combination of information and experience; the rest of us will learn through our own mistakes, seek out teachers, and do whatever it takes to move to the next level.

Chapter 13: Sound System Tuning Resources

- [The Sound System Tuning Roadmap Infographic](#)
- [Pro Audio Workshop: Seeing Sound](#)
- [Sound Design Live Blog And Podcast](#)