Episode Book

EPISODE #6635

Why Consistency Beats a Perfect Studio Setup

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SYNOPSIS

A pair of $99 PreSonus Eris 3.5 speakers squeezed behind computer screens in a shared nursery raises a practical question: how much of a studio do you actually need before your monitors become trustworthy? Exploring Genelec's placement geometry, Klippel spinorama measurements, and the physics of desk bounce, this deep dive reveals why a known midrange scoop and an 855 Hz desktop reflection matter far more than fifteen degrees of wall-mount tilt—and why a consistent, symmetrical setup beats chasing acoustic perfection.

TRANSCRIPT



Corn

Ninety-nine dollars a pair, and Daniel is worried about fifteen degrees of tilt.



Herman

I know which of those two numbers I'd worry about first.



Corn

That's more or less the episode, honestly. Daniel wrote in about his PreSonus Eris three-point-fives, the little desktop monitors. His home office is now half nursery for Ezra, so the speakers got squeezed onto the desk, behind his computer screens. He's considered wall-mounting them above and tilting them down, but they rent, and he's not eager to drill. And his own hunch is that none of this will make or break how reliable they are.



Herman

Which is the interesting part of the question, really. He's not asking how to build a studio. He's asking how much of a studio you actually need before the monitors become trustworthy.



Corn

And how you tune whatever compromised setup you've got so the sound hitting your ears resembles the file you're going to ship.



Herman

Then let's define the category first, because monitor is a word that gets used loosely. A studio monitor is a speaker designed to reproduce audio accurately rather than pleasingly. Flat frequency response, flat phase response. No bump in the bass to make your room feel expensive, no sparkle in the treble to flatter a tired mix. When engineers call a speaker a monitor, they mean it's supposed to be honest.



Corn

Which is a strange thing to buy, if you think about it. Most people spend money on speakers that lie to them flatteringly.



Herman

And there's nothing wrong with that. Hi-fi speakers are built to reproduce compressed commercial recordings that have already been mastered to sound good. Monitors have to survive the unmastered stuff. A raw mix can have a sudden burst, a snare hit that's way hotter than anything commercial, and the speaker has to take it without the amplifier clipping or the driver bottoming out. They're built like tools because they get used like tools.



Corn

The near-field part is what makes any of this possible in a bedroom, though.



Herman

That's the architectural idea underneath the whole category. A near-field monitor is small enough to sit on a desk or stand close to you, close enough that most of what you hear comes directly from the driver rather than bouncing off walls and ceilings on the way. The design is an attempt to make the room matter less. You sit inside the room's problems instead of listening through them.



Corn

So the whole category is a bet that proximity beats acoustics.



Herman

Roughly, yes. Which is good news for Daniel, because his room has a crib in it and a rental agreement over it. The catch is that his particular speakers are near-field in the physical sense but reference in the marketing sense only. Erin's Audio Corner put the second-generation Eris three-five on a Klippel scanner, proper spinorama measurement, and found the midrange sitting roughly seven to ten decibels below the highs.



Corn

Ten decibels.



Herman

That's not a subtle coloration. That's the difference between someone speaking to you and someone speaking to you from another room. His Gen one might measure differently, but the honest summary is that a ninety-nine-dollar pair is a reference-ish tool. The midrange scoop in his speakers is bigger than most of the placement problems he's losing sleep over.



Corn

So he's agonizing over the angle of the tilt while the speaker itself is off by a factor of three in the vocal range.



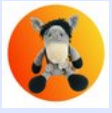
Herman

That's the tension, yes. Although I'd push back on my own setup there, because a known coloration is not the same problem as an unknown one. If the speaker is consistently scooped, you learn the scoop. You play a commercial track you know well through it, you hear where the vocals sit, and your brain builds the correction. An unknown, position-dependent coloration is worse, because it moves.



Corn

The known liar versus the stranger.



Herman

I'd take the known liar every time. That's what reference tracks are for, and we'll get there.



Corn

Before we do, the geometry. What does Genelec say, since they've written more about this than anyone?



Herman

Sixty-degree angle between the two monitors, listener at the tip of an equilateral triangle, each speaker aimed at your head. Acoustic axis, meaning basically the tweeter, at about one-point-two to one-point-four meters off the floor, which is seated ear height. And the part people skip: symmetry. Same distance from each speaker to its nearest side wall, same distance to the wall behind, same height. Symmetry is what buys you stereo imaging. If the left speaker hears the room differently than the right one does, the image smears.



Corn

Daniel's nursery split. If one side of the room is now a wall of soft fabric and a wardrobe, does that break the symmetry?



Herman

It changes the reflections on that side, certainly. Soft stuff absorbs highs, so the right speaker's reflections come back duller than the left's. Whether that's fatal is a different question. But it's the kind of asymmetry the triangle can't fix, because the triangle is about the speakers and him, not the speakers and the room.



Corn

The wall-distance thing is where the physics gets weird, though. Tell me the counterintuitive part.



Herman

Everyone's instinct is to pull speakers out from the wall, give them air. Genelec says the opposite for small monitors. Push them close, under about sixty centimeters, or push them far out. The two-to-four-foot zone is the worst possible place, because the reflection off the wall behind the speaker comes back and cancels the bass. There's a simple formula for it. The first cancellation dip lands at about eleven twenty-five divided by four times the distance to the wall in feet. Two feet out, the dip is around a hundred and forty hertz. Four feet, seventy. Right in the middle of the bass.



Corn

So the hip studio look, speakers floating on stands three feet off the wall, is engineering the worst possible bass response.



Herman

For a small monitor without a sub, yes. Either get them within about a foot of the wall, which pushes the dip up to around two-eighty where a small speaker radiates less backward anyway, or get them way out where the dip falls below the speaker's cutoff. One caveat for Daniel specifically: the Eris has a rear-firing port, so you need a couple of inches of clearance or the port chokes.



Corn

Desk against the wall, which is where his desk is, is accidentally the good configuration.



Herman

It is. And the wall gives him boundary gain, which is the other side of that coin. Every additional nearby wall doubles sound pressure at bass frequencies. One wall, plus six decibels. A corner, twelve. Corner by the ceiling, eighteen. That's why the Eris has that Low contour control around a hundred hertz, and it's the correct use of it, cutting a few decibels when the speaker sits near a wall.



Corn

Now the desk itself, because that's the problem nobody talks about at parties.



Herman

Nobody talks about it at parties, Corn, because you and I don't get invited to the good parties.



Corn

Speak for yourself. I bring leaf medicine.



Herman

The desk bounce is the best-documented problem in exactly Daniel's setup, and here's the worked example. Say the woofer sits nine inches above the desk, your ears eighteen inches above it, three feet back. Direct sound travels about thirty-seven inches. The desk



Herman (continued)

reflection behaves as if there's a mirror-image woofer nine inches below the desktop, and its path is about forty-five inches. The bounce is only about eight inches longer. It arrives about six-tenths of a millisecond late, and it's only about two decibels quieter.



Corn

Two.



Herman

Which means the reflection is nearly as loud as the direct sound. When two nearly-equal copies of a sound arrive a fraction of a millisecond apart, they comb filter. The first notch lands around eight hundred fifty-five hertz, with more at two-point-six and four-point-three kilohertz. That's the middle of the vocal range, carved up by your own desk.



Corn

His speakers are behind his monitors on the desk. So the sound path is speaker, over or around a screen, bounce off the desktop, into his ears.



Herman

Both problems stack. And the screen question is the one where the sources disagree. Sound On Sound and the Acoustic Fields people assert that a big panel between the speakers degrades the sound, surface area matters, a thin screen still reflects mids and highs. There's a bloke on Gearspace who measured his own setup with the screen lowered and tilted and found no difference at all, and made the reasonable point that studios flush-mount speakers into walls, which is the most reflective surface imaginable, and it works beautifully.



Corn

So the honest answer is nobody's measured it cleanly.



Herman

Nobody's measured it as a controlled variable, no. It's a plausible, physically motivated concern with no clean data behind it. And here's the thing I keep noticing: the desk bounce underneath the screen is measured, documented, sitting right there at eight-fifty-five. The screen debate is a fight about the smaller neighbor of a proven problem.



Corn

The screens are the suspect with the alibi.



Herman

Pending evidence, anyway. What did you make of his wall-mount plan, though? Because you have opinions about drilling into walls you don't own.



Corn

My opinion is that Hannah would notice the holes. But setting that aside, Genelec actually addresses his exact idea. Mounting higher with a slight tilt reduces floor reflections, and they say don't lift them so high that more than fifteen degrees of tilt is required for aiming. Also, avoid mounting at half the room's height, because the ceiling and floor set up sound-coloring resonances there.



Herman

So the plan is viable inside constraints. High, tilted down modestly, not at the room's midpoint.



Corn

Though the Eris cabinet has no tilt mechanism, per the reviews. He'd be building the bracket too. In a rental. To move a problem that's mostly the desk underneath it.



Herman

And honestly, Daniel's setup might be more normal than he thinks. Half the editors on earth have speakers behind screens on a desk against a wall.



Hilbert

Hilbert's Mid-Show Haiku. Titled Placement. Snow on the monitor. Behind it, a child is sleeping. The mix is not heard.



Corn

Ezra's nap schedule as an acoustic variable.



Herman

Actually, there's something real in that. Daniel edits video. Dialogue is the thing he's judging, and dialogue is exactly the range the desk notch carves up.



Corn

Which takes us to his actual question: does the compromise break it? He said himself he doesn't think it's make or break.



Herman

The literature backs him more than it scolds him. The Mixing Audio textbook puts it plainly: the monitors are just one variable. It's the monitors, their position, the listener's position, and the room's acoustic properties together that dictate the quality of the monitoring. Your Ferrari-in-second-gear situation. Genelec says the same thing from the other end, that calibration helps greatly but may not fully resolve room problems. Nobody in the professional literature says perfect placement is the bar. The bar is symmetry and consistency.



Corn

Consistent meaning what, in practice?



Herman

Meaning it's the same every session. If the speakers, the desk, the chair, and your head are all in the same relationship each time, your brain calibrates to that. What kills judgment is a setup that drifts, speakers moved to make room for something, a different chair.



Corn

Which is exactly what a shared office risks. Half the time there's a stroller where the reflection point should be.



Herman

And there's a finding that should comfort every home studio owner with bare walls. There was an AES study, King, Leonard and Sikora, testing absorption versus diffusion versus plain reflection at the first sidewall reflection points. Twenty-six professionals, working engineers and editors. No main effect. The treatment made no measurable difference to their judgments.



Corn

The foam industry would like that study buried.



Herman

It's one study, and I'd not build a religion on it. But Paul White at Sound On Sound has been saying the adjacent thing for years: most serious mix-translation failures come from big peaks and dips in the bass. And thin porous foam does almost nothing below three hundred hertz. So people buy foam to fix the frequencies the foam can't touch and leave the ones it could influence alone.



Corn

The treatment is for the problem they don't have.



Herman

Roughly. So no, Daniel shouldn't be draping the nursery wall in acoustic panels. What should he do instead? The free things first. Reference tracks. This is the cheapest calibration that exists, and engineers use them regardless of career stage. You pick tracks in the same genre and era as what you're making, commercially successful ones, and you learn your speakers against them. If the vocals on a track you've heard a thousand times sound scooped through your Eris pair, now you know your speaker, not your mix.



Corn

And there's a trap in the A/B, isn't there.



Herman

The loudness trap. A mastered reference track is typically about nine decibels louder than your in-progress mix. Louder is perceived as better, so if you A/B without level matching, the reference always wins and you chase its loudness with EQ and compression you don't need. You pull the reference down about nine decibels to compare fairly.



Corn

Nine decibels of pure flattery, removed.



Herman

Then fix your monitoring level and stop touching it. Sonarworks is blunt about this: you will not make objectively good judgments if you continuously fiddle with the level, because turning monitors up makes the lows and highs stick out more. The recommendations cluster around eighty to eighty-five decibels SPL, and the film and audio industry reference is eighty-three.



Corn

Daniel's editing video, so eighty-three is actually his number.



Herman

It is, though with a fifteen-month-old sharing the office, his monitoring sessions and nap windows are presumably the same event.



Corn

Beyond the free stuff, the contour controls. He's got a High shelf above ten kilohertz, plus or minus six, and a Low shelf at a hundred, plus or minus six.



Herman

And PreSonus's own manual is refreshingly strict. Set both to zero generally, prefer cutting to boosting, and don't use them to fix mix problems. They're room compensators, not mix tools. Near the wall, his Low control earns its keep, because that boundary gain is real. The High control is for a desk that's dull or a room that's glassy.



Corn

What I like about those controls is they're detents. Click, click, done, and they stay.



Herman

Consistency again. Which is the same reason software room correction is the step after, not before. Sonarworks SoundID Reference with a calibrated mic, their claim is plus or minus nine-tenths of a decibel accuracy, thirty-seven sweeps around the listening position within about forty-five centimeters. It can flatten what a speaker does at one spot.



Corn

The catch being that spot.



Herman

The catch being the spot. At two hundred hertz, a quarter wavelength is about seventeen inches. The distance from a peak to a dip in a standing wave. So one measurement at one point can send you chasing a problem that moves when you lean forward. You measure an area around where your head actually is, several positions, and average. And the correction can't fix the null from a boundary cancellation. EQ can't fill a hole that physics carved.



Corn

So the order is: geometry, then the little knobs, then reference tracks at a fixed level, and only then a microphone.



Herman

Yes. Though I'd put reference tracks above the knobs, honestly, because they calibrate the ear, which is the thing making the decisions.



Hilbert

Reflection.



Corn

That's the word you'd pick.



Hilbert

You two have said screens five times. The screen is a red herring. I measured my own desk in the old flat, borrowed a mic off a man at the darts club, took the screen down, put it back, tilted it, laid it flat. Nothing. Put the mic where my head goes and the notch was there the whole time. Eight hundred forty hertz, give or take. I've still got the graph on my phone.



Herman

Eight-forty. That's the desk bounce right where the math puts it.



Hilbert

Because it's the desk, Herman. Speaker nine inches up, bounce off the chipboard, comes back nearly as loud as the direct sound. The screen never had anything to do with it. I never fixed mine either. I learned where it sat and mixed around it, and I'll tell you it made me better, not worse. I've got a notebook with a page for every room I've ever mixed in. Quirks, notches, where the bass lies. That one's labelled chipboard shelf, eight-forty, don't boost the vocal there, it's you, not the mix.



Corn

You hand-labelled the desk's lie.



Hilbert

It's faster than fixing it. The darts club man wanted his mic back by Friday, so that part had a deadline. The notebook has no deadline. And I did a season of wedding sound with that notch in my ear, so I'd know.



Herman

The notebook idea is more defensible than it sounds. That's exactly what the reference-track habit is, a written record of how a known source sounds in a known room. He's just keeping the record on paper and per room.



Corn

And he's proof of your consistency argument. Same desk, same notch, same ear, every session. The setup doesn't drift, so the brain corrects.



Hilbert

The brain corrects, yes, but you've missed the part about the mic. Friday deadline. Some of us calibrated under conditions.



Corn

Fair.



Herman

The one thing I'd hold onto from that is the label, honestly. Not the notch, the act of naming it. Most people with bad-sounding desks don't know they have a desk problem, they think they have bad ears.



Corn

If you take one thing from this: the near-field monitor was invented to rescue you from your room. That's the whole design. Sit close, aim the drivers at your ears, keep the left and right sides symmetrical, keep the desk between the speaker and your head as small as it can be. You're not building a control room, you're maximizing direct sound over bounced sound.



Herman

And the part that should comfort Daniel: his instincts were right twice. The compromise isn't fatal, and the desk-against-the-wall layout that renting forced on him is, by accident, the configuration Genelec recommends. Ninety-nine dollars buys a speaker that colors the truth, but it colors it the same way every day, and a consistent lie is something you can work with.



Corn

The open question I'd leave him with is whether the next decade of video editors mixing in nurseries and spare bedrooms finally forces the industry to sell monitoring that matches how people actually work, instead of selling reference on the box and reference-ish in the midrange.



Herman

The Eris is a fine place to start. It's just not a place to finish.



Corn

Thanks as always to our producer, Hilbert Flumingtop, who has apparently been running calibration experiments under conditions this whole time.



Herman

If you enjoyed this one, try episode five, Fine-Tuning ASR For Maximal Usability; and episode ten, How ASR Went From Frustration To ... Whisper Magic. This has been My Weird Prompts. If you've got a pair of speakers you've never quite trusted, this is the episode to hand to someone, and a review on Spotify helps more people find the show.



Corn

You can find everything we do at my weird prompts dot com.



Herman

See you tomorrow, Corn.



Corn

Tomorrow. Sleep on it first.

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