

FIELD GUIDE

Mix for the room they're **not** in.

The people watching from home hear only what you send them. Nothing from the actual room reaches them. This guide is about making that signal sound like being there, and fixing it when it comes out thin, hollow or too quiet.

What this covers

Why the stream needs its own mix, how to set clean levels, how loud to make it, and how to fix the sound problems that show up on a livestream and nowhere else.

Who it's for

The person mixing sound while the stream is live. Some of this gets technical. You can run a clean service on the first three parts and come back for the rest.

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anywhere.**

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A field guide to livestream sound • Edition 1

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The one line to remember

The room reinforces what's already in the air. The stream carries only what leaves the desk. So mix the desk for someone who cannot hear the room at all.

PART 1 • THE CORE IDEA

1 The stream is a different room

One idea holds up everything else in this guide. Once it clicks, most stream sound problems explain themselves.

What the room hears

In the room, sound reaches people two ways. Some comes straight off the stage: the drums, an amp, a strong voice carrying to the front rows. The speakers only add to that, filling the gaps and pushing it to the back. So the person mixing for the room often pulls those loud sources down in the speakers, because the air is already carrying them.

What the stream hears

The stream hears none of the air. It gets only the electrical mix that leaves the desk. Anything the room was hearing acoustically, and not through the desk, simply is not on the stream. That is why a mix that sounds full and balanced in the room can arrive thin and empty online.

In the room

Stage sound plus speakers. The loud things are already in the air, so the mix holds them back. People hear the sum of both.

On the stream

Only the desk's electrical mix. Nothing from the air. If it isn't sent down the wire, the person at home never hears it.

So the stream needs its own mix

This is the whole guide in one move. The stream needs a mix built for it, not a copy of the room mix. On most desks that is a separate send: an aux, a matrix, or a dedicated broadcast mix. It carries everything, balanced for someone who has only your signal and, usually, a phone speaker.

If you take one thing from this guide: give the stream its own mix, independent of the room. Everything that follows is detail sitting on top of that single decision.

2 The signal path, start to finish

Every sound travels the same road, from a person on stage to a viewer on a sofa. Knowing the road tells you where problems live, and stops you fixing them in the wrong place.

1

The source

A voice, an instrument, a playback track. If it's noisy or distorted here, nothing downstream can rescue it.

2

The input and gain

The preamp sets how hard the desk listens to that source. This is the first and most important level, and it's set here, before anything else.

3

The channel

EQ, dynamics and the fader shape the sound and set how loud it sits in the mix.

4

The broadcast mix

A separate send that gathers everything the viewer should hear, balanced for the stream rather than the room.

5

The encoder

Turns your audio and video into a stream. It sets the final loudness ceiling and it's where audio and video get lined up.

6

The platform, then the phone

The platform squeezes the stream to send it, and most people play it back on one small speaker. Your mix has to survive both.

A problem you hear on the stream started somewhere on this path. Work it in order. Is the source clean, is the gain right, is it in the broadcast mix, is the encoder set. Guessing in the middle is what wastes the most time during a live service.

PART 2 · A CLEAN SIGNAL

3 Gain, set once

Gain is the first level in the chain and the one most often set wrong. Get it right at soundcheck and everything downstream gets easier.

Gain is not volume

Gain sets how hard the channel listens to its input. The fader sets how loud that channel sits in the mix. They are different jobs. A quiet channel, or one with a hiss under it, is usually a gain problem, and no amount of fader will fix it cleanly. You'll just make the noise louder too.

Set it by the meter

- ✓ With the source at **real service level**, someone speaking or singing as they actually will, bring the gain up until the channel meter sits healthy: well up, with clear space still left before the top.
- ✓ **Peaks should not touch the top of the meter.** The top is where the sound distorts, and distortion cannot be undone later.
- ✓ If you're pushing the fader right up to be heard, **the gain is too low.**
- ✓ If you're pulling the fader right down to stop it clipping, **the gain is too high.**

Set gain at service level, not at a polite half-volume. People get louder when the service starts and the room fills. A gain set to a quiet rehearsal will clip the moment it matters, and that's the moment the stream is watching.

What healthy looks like

Healthy	Peaks land with headroom to spare, the average sits comfortably below the top. Clean and quiet.
Too hot	Peaks hitting the top, the meter going red, the sound hardening and distorting.
Too low	Fader pushed high to compensate, hiss and room noise creeping up with the level.

4 The send to the stream

This is where the broadcast mix is built. Two decisions here fix most stream sound: keep it independent of the room, and think in mono.

Keep it independent of the room

Build the stream mix on its own send, so your room fader moves don't drag the stream around with them. When you pull the drums down for the room, the stream should still have them. One shared fader cannot serve two different rooms at once, and the stream is a different room.

Think in mono

Most people watch on one phone speaker, which is mono. A wide stereo mix with hard-panned instruments can collapse when the platform or the phone sums it to mono, and parts can drop out or go hollow. A mono, or only lightly stereo, broadcast mix is safer, and it sounds the same to everyone whatever they're watching on.

Put everything in, balanced

- ☐ Every voice and instrument the viewer should hear, **including the ones the room got acoustically** and you held back in the speakers.
- ☐ A little room or ambience mic, kept low, so the stream has life and isn't clinically dead. More on this in section 9.
- ☐ Playback and any video audio, **routed into the broadcast mix**, so clips and songs aren't silent for the people at home.

Check the stream mix on headphones fed from that send, not off the room speakers. The room speakers are carrying sound the stream will never get, so they lie to you about what the stream actually sounds like.

PART 3 • MAKING IT SOUND GOOD

5 Loudness

How loud to make the stream, in numbers you can aim at. The goal is steady and comfortable, not loud.

Aim for a loudness, not a peak

Modern platforms measure loudness over time, in units called LUFS, and quietly turn everyone towards a similar level. Chasing the loudest possible signal just gets turned back down again, often unevenly, so it's wasted effort. Aim for a consistent loudness instead, and the platform mostly leaves you alone.

AIM FOR	A WORKING TARGET	WHY
Integrated loudness	around -16 to -14 LUFS	Close to where platforms normalise, so you're neither pushed down nor dragged up.
True peak	under -1 dBTP	Leaves room so the platform's own compression doesn't clip and turn crunchy.
Swings in level	keep them gentle	Big jumps between a whisper and a shout are hard to follow at one fixed volume at home.

These numbers vary by platform and change over time. Treat around -14 LUFS integrated and -1 dBTP true peak as a safe working target, not a law. Trust a loudness meter over your ears once the room gets loud, because your ears drift and the meter doesn't.

Use a limiter as a seatbelt

A gentle limiter on the broadcast mix, set just below your true-peak ceiling, catches the surprise peaks: a sudden shout, a dropped mic, a bumped stand. It's a seatbelt, not a sound. If it's working hard all the time, that's a sign your levels upstream are too hot and need pulling back, not a sign the limiter is doing its job.

6 EQ and dynamics, lightly

You can improve a voice a lot with a few small moves, and ruin it just as fast by doing too much. Start light and stop early.

A safe starting point for a voice

- ✓ A **high-pass filter** around 80 to 100 Hz, to cut rumble, handling thumps and breath pops that a phone speaker can't reproduce anyway.
- ✓ A **small cut** where it sounds boxy or harsh, rather than a big boost somewhere else.
- ✓ **Gentle compression**, just a few dB of gain reduction, so the quiet words and the loud words sit closer together.

Cuts sound more natural than boosts. If something sounds wrong, find the frequency that's too much and take a little out, before you reach to boost something to cover it. Subtracting the problem beats adding around it.

One compressor you'll actually use

On the main voice, a moderate ratio and a threshold set to catch the loud words, aiming for just a few dB of gain reduction on the peaks. The goal is a voice that stays present when the speaker steps back or drops to a near-whisper, without pumping, breathing or sounding squashed.

Every process adds a little delay and one more chance to make things worse. On a livestream, fewer and gentler moves beat a long chain of plugins. When you're not sure a process is helping, take it out and listen. Usually you won't miss it.

PART 4 · WHEN IT SOUNDS WRONG

7 Why the stream sounds thin or hollow

Thin, distant, phasey, hollow. These are the sounds a livestream makes that a good room doesn't. Here's where each one comes from, and the first move to fix it.

WHAT YOU HEAR	LIKELY CAUSE	WHAT TO DO FIRST
Thin, no low end	The loud acoustic sources, drums, bass, a strong voice, aren't in the electrical mix, only in the room air.	Add them properly to the broadcast mix. The stream cannot hear the room.
Distant and echoey	The stream is taking its sound from a camera's onboard mic, which hears the room and the speakers, not a clean feed.	Feed clean audio from the desk to the camera or encoder, and stop using the camera mic.
Hollow, underwater	Two mics on one source at different distances, or a stereo mix cancelling itself when summed to mono.	Check phase, mute one of the doubled mics, and mix the broadcast closer to mono.
Harsh and fizzy	Too much high-end boost, or an audio bitrate too low for the sound to survive.	Ease off the top-end EQ, and raise the audio bitrate if the encoder lets you.

The camera-mic trap catches almost everyone once. A camera pointed at the stage picks up the room and the PA, arriving late and smeared together. It always sounds worse than a clean line from the desk. If the stream sounds far away or echoey, check this before anything else.

8 Hum, buzz, echo and delay

The electrical and timing problems. Less about mixing, more about how things are wired and how sound gets back to where it shouldn't be.

Hum and buzz

A steady low hum, or a harsher buzz, usually means a ground loop: two connected devices grounded through different paths, and the difference leaks in as noise. Balanced connections resist it. A direct box with a ground-lift switch often cures it outright. Lighting dimmers and cheap power supplies add their own buzz, so keep audio cables away from power and lighting runs where you can.

Echo on the stream

An echo online usually means the stream's own sound is getting back in. Either the stream is playing somewhere near an open mic, or a presenter is monitoring it on a phone or laptop. The stream is delayed, so it returns a beat late and doubles everything. Keep the stream's return out of the room, and keep any phone playing the stream well away from live mics.

Lip sync and delay

Audio and video can drift apart on the way to the stream, so mouths and words stop lining up. Most streaming software has a delay control to nudge one to match the other. Set it once at the encoder, and check it on the actual stream, not on the desk, because the desk doesn't have the delay the viewer does.

9 Feedback and the quiet moments

Two opposite problems: too much level in the room, and too little on the stream. Both land on the people at home.

Feedback

Feedback is a mic hearing its own speaker and looping into a squeal. It's a room problem, not a stream problem, but it goes out on the stream all the same. Keep mics behind the speakers where you can, keep unused mics down, and don't push a mic past the point where the room starts to ring. If one particular note always rings first, a narrow cut at that frequency buys back a little room before it starts.

The quiet moments

In a silent prayer or an altar moment, a stream with every mic closed goes completely dead, and the people at home start wondering if it froze. A little room or ambience mic, kept low, gives the stream a sense of presence: the soft sound of a room full of people, without adding enough level to feed back. Bring it up gently in the quiet, ease it back when the band returns.

Dead air reads as a broken stream. A low, clean ambience under the quiet moments tells the people at home they're still in the room with everyone else, even when nobody's speaking.

PART 5 • REFERENCE

10 A signal flow that works

One dependable setup, in plain terms. Not the only way to do it, but a way that avoids the common traps.

- 1 Every source into the desk, **gain set at service level** with headroom to spare on the meter.
- 2 Voices **high-passed and lightly compressed**, instruments balanced against them.
- 3 A **separate broadcast mix**, independent of the room fader moves, summed to mono or only lightly stereo.
- 4 **Everything the viewer should hear** routed into that broadcast mix, including a low ambience mic and any playback.
- 5 A **gentle limiter** on the broadcast mix, sitting just under the true-peak ceiling.
- 6 That mix into the encoder, **loudness aimed around -14 LUFS**, and lip sync checked on the real stream.

Build it once, then write the routing down. Next week you rebuild it in minutes instead of rediscovering it live with the clock running. The best broadcast setup is the boring one you can repeat without thinking.

11 The audio checklist

Run this before you go live. It's the whole guide, compressed down to things you can tick off at the desk.

Signal

- ☐ Gains set at service level, with headroom
- ☐ Voices high-passed
- ☐ Nothing clipping the meters

The stream mix

- ☐ Broadcast mix is independent of the room
- ☐ Summed to mono or lightly stereo
- ☐ Every source the viewer needs is in it
- ☐ A low ambience mic is in it

Loudness

- ☐ Limiter on the broadcast bus
- ☐ Loudness around -14 LUFS
- ☐ True peak under -1 dBTP

Sanity checks

- ☐ Checked on headphones from the broadcast send
- ☐ Checked on a phone, on cellular
- ☐ Lip sync lines up
- ☐ Clips and videos have sound online

If every box is ticked, the people at home hear the service the way the room does. That's the entire job, and it's a quiet, invisible one when it's done well.

If you remember nothing else

The stream is a different room. It hears only what leaves your desk, played back on a small speaker, by someone who wasn't there. Give it its own mix, keep that mix clean and steady, and check it on the actual stream, not the desk.

Do that, and the back row of your church reaches anywhere.

A word to the sound volunteer

Sound is the job nobody notices until it's wrong, and yours is often the hardest seat in the building. When the mix is right, a stranger three hundred miles away hears the message as clearly as the front row. That's worth getting right, and it's worth the hours you put into it that nobody sees.

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