DCSOUNDOP

Wireless Mic & RF Basics Cheat Sheet

A practical pre-gig checklist for keeping wireless systems clean and dropout-free.

BEFORE YOU BUY OR DEPLOY

- **Legal frequency use varies by country and changes over time** as spectrum gets reallocated. Always confirm what's legal to use in your region before buying or deploying a wireless system, rather than assuming a frequency range is safe because it was fine somewhere else.
- **Licensed vs. license-exempt operation** is a real distinction in many regions: some frequency ranges require registration or a license for professional use, others are open but more crowded. Check your local regulator's current rules.

FREQUENCY COORDINATION BASICS

Running multiple wireless channels at once means avoiding **intermodulation distortion**: when two or more RF signals mix and produce unwanted extra frequencies that can land on top of another channel you're using. This is why wireless channels aren't spaced randomly.

- Use your manufacturer's frequency coordination software or built-in scan/group-and-channel system rather than picking frequencies by hand for anything beyond one or two channels.
- Re-scan for a clean frequency at each new venue. A frequency that was clear last week can be occupied by another production, a TV broadcast, or someone else's gear this week.
- Keep transmitters and receivers from the same manufacturer's coordinated group together as a set; mixing coordinated groups from different systems can reintroduce the intermodulation problems the coordination was solving.

RF BASICS ON THE DAY OF THE GIG

- **Antenna placement:** keep receiver antennas within line of sight of the performers where possible, and avoid mounting them directly against metal racks or surfaces, metal close to an antenna can detune it.
- **Diversity reception:** most professional wireless systems use two antennas per receiver channel and switch to whichever has the cleaner signal moment to moment. Keep both antennas reasonably spaced apart rather than bundled together.
- **Distance and obstructions:** bodies, walls, and especially metal staging or truss between transmitter and receiver reduce range. Line of sight is always the best case.
- **Fresh batteries, every time.** A transmitter running low on power is one of the most common causes of a wireless channel that was fine at soundcheck and isn't fine two hours later.

COMMON SYMPTOMS & LIKELY CAUSES

SYMPTOM	LIKELY CAUSE
Dropouts in specific spots on stage	RF dead zone, obstruction, or interference at that location
Garbled or "underwater" audio	Weak signal, often low battery or out of effective range
Distorted signal even at close range	Transmitter input gain set too hot, this is a gain-staging problem, not an RF problem
Sudden dropout mid-show that wasn't there at soundcheck	New interference source came online nearby (another production, broadcast van, etc.)

> **Worth remembering:** not every wireless problem is an RF problem. A transmitter with its input gain set too hot will sound distorted no matter how strong the signal is, that's a gain-staging fix, not a frequency fix. Check the simple stuff (battery, gain, antenna orientation) before assuming you need to re-coordinate frequencies.