TECH TALK : 6 *KEYS TO FINDING A GOOD WIRELESS MIC*

1. **FREQUENCY AGILITY** – the ability to change frequencies when there is interference from another source. The more frequencies available to you, the more likely you can find a clear one. Cheap mics are usually fixed frequency so when interference comes, you're stuck with an unusable piece of equipment. Most frequencies are VHF or UHF, however, in 2010 the FCC "outlawed" the 700 MHz band (698–806 MHz) and the 600MHz band (614-698 MHz) in 2017 for use in the USA.

TECH NOTE: BUYER BEWARE: there are still people trying to sell the "outlawed" 600MHz and 700MHz mics on Ebay, Craigslist or Facebook Marketplace, even as I update this in 2025.

So the "fix" seemed to come with 2.4 GHz mics in 2015, 1.9 GHz in 2019 and 5.8 GHz in 2023. The problem is 2.4 GHz and 5.8 GHz get interference from WIFI networks and 1.9 GHz sometimes gets interference from DECT 6.0 cordless phones. The key is to use them outside, where there is less possibility for interference or to unplug the WIFI or a cordless phone.

So what Frequencies are good in the USA? Currently 470 MHz- 607.9 MHz and 807 MHz – 951.9 MHz.

TECH NOTE: Another source of interference for all mics is cellular phones. Oddly enough, I have had 3 occasions where cellular phones have caused major interference because they were used near a transmitter or a receiver.

2. **SIGNAL DIVERSITY** – allows for the receiver to catch the transmitted signal twice and use the stronger of the two. This improves the overall signal quality and can usually be seen externally on the receiver with two antennas. With only one antenna, you are more prone to drop outs – especially with some distance between the transmitter and receiver. Personally, I prefer half wave dipole antennas which is an upgrade from the stock 1/4-wave antennas that typically come with a receiver.

TECH NOTE: Large systems with multiple mics, may require an Antenna Distribution System (also called combiners or splitters) plus large Directional Antennas. Whereas smaller receivers on cameras (aka ENG) that have small antennas that work great in closer proximity to the transmitter.

3. **MIC ELEMENT** – largely depends on how and where you use the mic.

A Handheld usually works best with a cardioid, super cardioid or hyper cardioid element, rejecting the audio to the rear of the mic. Some handhelds allow for swapping mic heads for different applications our singers, however, cheaper mics are usually soldered to the handle.

TECH NOTE: Singers or speakers need to grip a handheld in the center. If they grip it at the bottom, this will diminish the signal to the receiver and gripping toward the capsule will increase the chance of feedback.

As for belt packs, most of my experience has been on a theatrical stage, in church or in classroom settings. In my opinion, the best solution for belt pack wireless is usually a head worn, omni-directional mic because you can get the most gain before feedback. Some speakers may feel that a head worn mic is distracting but once they get used to it, most speakers love it. The placement of a headset mic is crucial. The element needs to be 1-2 finger widths from the edge of the mouth. The cable also needs to be secured with a clip or tape (hypoallergenic / medical) with enough slack so that the wire does not feel tight when the speaker moves their head from side to side.

TECH NOTE: I recommend a headset mic that fits over both ears not just one ear because a single ear tends to be floppy whereas a double ear gives you a snug fit. In my experience, single ear mics can be distracting to both the speaker and the audience.

If a head worn mic is not for you, then I would suggest a quality omni-directional lavalier mic (cardioids tend to pop a lot – a.k.a. plosives). Generally, I will clip a lavalier about 5 inches below the mouth (the distance from your thumb to your pinky) and as close to center as possible - with some exceptions. This gives a better proximity effect where the audio is more level if the speaker turns their head to either side. However, if a jacket or suit coat is used, the preferred placement may be on the lapel of the coat so that there is not hollow sound if the coat bunches over the element. The tradeoff may be less levelized audio from the speaker. If the speaker has a T-shirt or sweater with a high neck, try placing the mic off center along the side of the collar and run the wire down the back of the shirt.

TECH NOTE: If the speaker has a loud, booming voice, try inverting the mic capsule (pointing down) so that the element is not overdriven.

Wind can be a killer for your audio and a standard wind screen on your element might help but in very windy locations, you might need a dead cat. If you are not familiar, it is an extra furry wind screen specially designed to reduce wind noise when recording outside.

4. BATTERY – There are several mics with built in rechargeable batteries which sounds great and environmentally friendly, until your battery dies mid production and there is no way to change it out. Personally, I prefer to use Duracell Pro Cells or Energizer Industrial batteries. If you want to be "environmentally friendly", use a quality set of rechargeable batteries but with this caution. Pairs of batteries should be marked and charged or discharged together. Do not mix them with older batteries. Also, keep in mind that rechargeables will eventually loose their potency.

TECH NOTE: *I have another article that breaks down the longevity of several battery brands at www.rosemontstudio.com/tech-talk*

5. **BRAND NAME & REPUTATION:** I usually stick with proven leaders such as Audix, AKG, Countryman, DPA, Lectrosonics, Rode, Sennheiser, Shure, & Sony to name a few. You've heard the saying: "You get what you pay for." The same goes for audio equipment. Spend a little more for quality and it will usually last you a long time. In my opinion, stay away from garage band companies and off brand equipment – I have rarely had any perform well and they don't seem to last very long. With that said, I have been pleasantly surprised with the quality of Deity, Galaxy Audio, and Sermonic microphones.

6. REVIEWS – I always look at the reviews because if people are having problems or great successes they will talk about it. For me, generally it has to be a 4 or 5 star review from multiple sources, unless it is a new product from a reputable manufacturer.