

RF Basics 07 - What is RF Diversity?

- *Why two antennas are better than one.*

Back in the day, RF systems used one antenna on the Tx and one on the Rx unit just like a TV or radio broadcast. This was fine, apart from the dropouts, until some bright spark wondered what would happen if an Rx unit could switch between 2 antennas depending on which antenna is receiving the strongest signal. Thus was born the diversity antenna setup. From its humble beginnings the diversity concept has grown to include multi-zone diversity and Quadiversity, more on those later.

Diversity receivers use 2 antennas (A and B) to maximize RF signal reception. Basically, a diversity system has 2 locations to receive the signal. This helps ensure reception of a strong signal and can help minimize reception problems like dropouts. The wireless product automatically chooses which RF antenna input to use. Switching between the A and B antennas is seamless.

There are two main types of diversity systems:

- Predictive Diversity - A processor switches the strongest signal to a single receiver.
- True Diversity - Uses two separate receivers to demodulate each RF signal separately. A processor then selects the better of two audio outputs. This is a more expensive approach but can be more reliable.
- [DIAGRAM OF RF PATH WITH SINGLE AND DIVERSITY ANTENNA]

But wait, there's more! Multi-Zone Diversity!

Multi-zone diversity uses multiple sets of diversity (A and B) antennas sets to cover more area. These other areas could be 2 sections of a ballroom divided by an airwall, an overflow room, tunnels behind a court or sports field or a backstage area. Multi-zone diversity ensures that microphones can operate seamlessly in all required areas, rather than just a main performance space. Using a distro such as the Omega series different zones can be setup with different RF gains.

[DIAGRAM OF 2 DIFFERENT MULTI-ZONE SETUPS]

But wait, there's even more! Quadiversity!

As a diversity system uses 2 antennas (A and B) to maximize RF signal, a Quadiversity system uses four antennas (A, B, C & D) to perform the same function with four antennas. Again, this will help ensure reception of a strong signal and can be used to increase the coverage area of the wireless microphone system.

[DIAGRAM OF QUADIVERSITY AND HOW IT DIFFERS FROM MULTI-ZONE]

● **Related PWS Product - LP A antenna, Alpha Series distributor, Omega Series, 4 4 Quad, Antenna mounts, Cable**

Continue with RF Basics 0 - Why are there multiple antenna types?