

**The Technical Side:**

**Why buy a noise cancelling headset?**

When asked what headset a new pilot should purchase our somewhat cheeky response is “do you want to buy one or two?” We go on to explain you can buy a good quality (or not) passive headset but ultimately you’re going to end up with an Active Noise Cancelling unit – they really are that good!

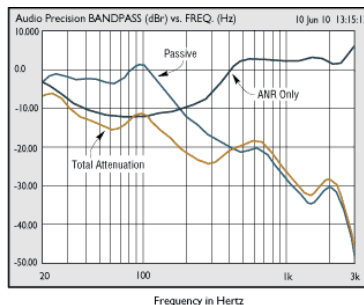
**ANR Technology Explained:**



Active noise reduction is a relatively new technology that is especially effective at reducing low frequency noise, such as the engine and propeller noise in a light aircraft. ANR was first conceived in the 1930s and had started showing up in science fiction stories by the 1950s, but it was the 1970s before mainstream scientists began to investigate the

possibility seriously. ANR technology didn't become a reality in general aviation until the 1990s. Here's how it works: A tiny microphone, typically placed in the earcup of a headset, picks up noise inside the earcup. That information is transmitted to the headset's electronics, which drive a speaker, also inside the earcup, to produce a noise that is the exact mirror image of the original noise. In other words the "trough" of one sound wave (the noise caused by the propeller) corresponds to the "crest" of another (the "antinoise" created by the headset). When the sound waves collide, they cancel each other out; so what you hear is the sweet sound of silence

That's not to say that an ANR headset will leave you unable to hear the important things going on around you like air traffic controller instructions and the hum of the engine that lets you know everything is as it should be. on low-frequency noise. (This causes permanent hearing experienced over a long period to affect the relatively higher voices. In addition, it really only those sounds containing a very



ANR works most effectively is the kind of noise that loss across all frequencies, if of time.) ANR does very little frequencies of, for example, works well for tonal noises like limited number of frequencies,

such as propeller noise; so you still hear broadband, mixed frequency sounds, such as the wind flowing over the airframe. You can also tell when a sound changes. So, if the rhythmic pulse of

the propeller is altered by the addition or loss of power, your ears will tell you about it. Noise Cancellation graph showing both ANR and Passive reduction working in unison.

Much is made of noise canceling microphones and with good reason the less background noise cluttering up your transmissions, the better. Any type of microphone can be designed to help cancel noise, but electret microphones are generally considered the most effective when it comes to noise cancellation. Most modern headsets, both ANR and Passive now use these electret microphones.

Here's how it works: When sound waves, including the undesirable sound waves we call noise, reach the diaphragm of a microphone, those sounds are transmitted. But, if sound waves reach both the front and back of the diaphragm simultaneously, the diaphragm doesn't move, effectively canceling out the sound. Noise canceling mics have openings that channel ambient noise to both sides of the diaphragm. When you speak into the microphone, however, the sound waves from your voice hit only one side of the diaphragm, allowing it to flex.

### **Other Features**

Since ANR headsets have a microprocessor on board most come with one or more additional features. Here are but a few to consider

- Bluetooth capability for cell phone and music
- Auto on/off detection (to save those batteries)
- Auto muting or reduction of music/cell if ATC becomes active
- Enhanced concert-class music fidelity
- Custom Acoustic response mapping to your ear
- iOS link for recording/playback/customization
- Firmware updates via a USB port

There are now many brands of ANR headsets for sale. The two leaders in the industry are Bose and Lightspeed. When it comes to choosing a headset, there are a lot of decisions to make, many of them personal. We recommend you come in borrow a few and go fly with them to see which ones work for you.





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## **Works Consulted**

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