



Use EAA's online spreadsheet (see www.SportAviation.org) to shop by price, weight, or whatever variable is important to you. Turn the page for a quick primer on the different headset types.

Loud AND Clear

Selecting the right headset for your needs

BY PETER LERT

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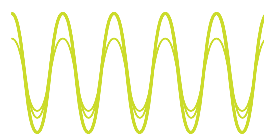
HEADSET SHOPPING CAN BE confusing. It's a must-have accessory, but there's a vast array of models, types, and options available at a wide range of prices. To help you wade through the choices, EAA conducted a review of the headset marketplace, covering 141 different headsets offered by 23 different manufacturers.



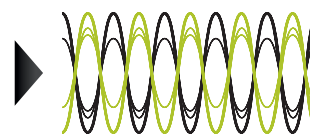
HOW NOISE CANCELING WORKS

WAVE RIDING

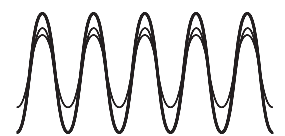
Noise-canceling headphones reduce unwanted ambient sounds (i.e., acoustic noise) by means of active noise control (ANC). This involves using one or more microphones placed in the headset near the ear, and electronic circuitry that uses the microphone signal to generate an "antinoise" signal.



Noise that originates from an outside source



The headphone antinoise and the noise cancel each other out.



Antinoise soundwaves generated by the headphone speaker

Passive Noise Reduction Headsets



David Clark H10-13.4

PASSIVE NOISE REDUCTION (PNR) headsets depend on three factors to determine how efficiently they attenuate ambient noise: the size of the ear cup, the compliance (squishiness) of the ear-seal material, and the clamping pressure of the headband/ear cups against the wearer's head. The higher the clamping pressure and the squishier the seals, the quieter the headset will be—particularly if the seal has to conform around prescription glasses or sunglasses.

The upside of PNR headsets is that they provide good protection and clear communications at relatively affordable prices, ranging from under \$70 to more than \$400. As price increases, expect more comfortable ear-seal materials, better headband quality, higher-quality speakers and microphones, and flexible (rather than articulating) microphone booms. The more expensive headsets often have separate volume controls for each ear, as well as switching to allow either mono or stereo use. Another increasingly common feature is a separate input to connect a music player or a cell phone. The most expensive models provide an "auto mute" feature to turn down the music when there's radio or intercom traffic on the headset.

If there's a downside to passive headsets, it might be weight and bulk. Yet some of the more expensive units use materials such as titanium and carbon fiber and therefore fall in the lighter end of the range.

Active Noise Reduction Headsets



Lightspeed Aviation Zulu

EXTERNALLY, MANY ACTIVE NOISE reduction (ANR) headsets look nearly identical to their passive counterparts. The difference is that the ANR units all have a tiny microphone in each ear cup to pick up ambient sound, as well as electronic circuitry (either in the ear cups or in a "dongle" on the headset cord) to provide the correct level of "anti-noise" that cancels much of the background noise while continuing to transmit the signals the pilot actually wants to hear.

ANR headsets typically also provide a reasonable level of passive protection, which in particular helps suppress high-frequency noise, such as the rush of air past the airframe.

Price, weight, and bulk have all come way down from the first ANR aviation headset offered by Bose in 1989. While prices top out at \$995, ANR headsets are available all the way down to the \$230 price point. By the time you're up to about the \$400 price point, you'll begin to get very good noise cancellation—but even the less-expensive models can be pretty good (and better than many passive headset models).

ANR headsets have a downside; they need power to work their magic. Most models include a power and control box on their input cable, and a couple of AA batteries should run them for 20 to 40 hours. Many can also plug into a cigarette lighter, or directly into a special connector plug in the panel.

In the Ear Headsets



Clarity Aloft Pro

AS THE AGE OF jet airliners dawned, the hallmark of the jet pilot was a trusty Telex Earsset—a single ear-plug with an inline volume control. The Telex is still in production, but in the last few years it's been joined by a range of other in-the-ear types that include microphones. Several manufacturers have begun to offer lightweight, aviation-specific, in-the-ear headsets using foam, silicone, or custom-molded ear molds. Much of this technology has been driven by the burgeoning use of in-the-ear headphones for entertainment.

All of these units are passive, but since they make a positive seal with the ear canal, they can offer noise reduction comparable to that of ANR products (and can even be better at higher slipstream noise frequencies). In terms of comfort, their light weight is unbeatable—less than half an ounce for some!—but not everyone is comfortable with an object in his or her ear canal for long periods of time. Some versions include some form of headband, while others do not; in the latter case, the stability of the microphone boom depends on the fit of the earplug, ear mold, and/or over-the-ear hook (like those seen on cell phone headsets).

Despite their seeming similarity to inexpensive entertainment earphones, these units aren't cheap—they're not quite worth their weight in gold, but prices range up to \$695 for an airline-approved TSO'd version from Aloft Technologies.

Emerging Technology



AT-EQ-1 Wireless Headset

THE LATEST BUZZ (no pun intended) in headsets is digital, rather than analog, noise reduction. The claimed advantage of digital processing is that it's particularly good at eliminating noise that's a single frequency (or distributed closely around one). Propeller noise is exactly that, so such headsets work extremely well in prop aircraft. However, if the offending noise covers a wider range of frequencies—for example, if you're hearing both the prop and engine exhaust—the advantage may not be so great.

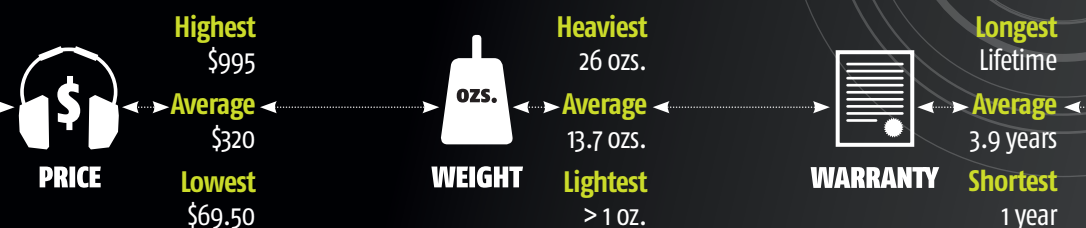
Most recently, AT Electric and Communication International introduced the AT-EQ-1 wireless ANR aviation headset system, believed to be the first wireless headset. At the heart of the EQ-1 wireless system is a small lightweight control unit that can be located anywhere out of sight. The control unit receives and transmits information to the headsets, eliminating the need for the usual tangle of cords associated with headsets.

Aviation headset technology will continue to advance, no doubt spurred on by developments in other market sectors...and that's good because we'd all love to continue to hear loud and clear! **EAA**



Peter Lert, EAA 500533, started flying sailplanes in 1964. He's currently an air ambulance pilot...and celloist and audiophile by avocation. You can view or download the spreadsheet online at www.SportAviation.org. An interactive buyer's guide is available at www.Sportys.com/headsetwizard.

Quick Comparisons from the Online Spreadsheet



A Noise Canceling First...

PHYSICIST AND MUSIC LOVER Dr. Amar Bose first had the idea to develop noise canceling headsets while on a 1978 airline flight. In 1986, when the *Voyager's* non-stop, globe-girdling flight was being planned, the Bose company



offered its new noise-canceling headsets to the crew for the first-ever use by pilots. Dick Rutan and Jeana Yeager spent nine days circling the globe and, because of the noise canceling headsets, suffered no measurable hearing loss.