AVIATION HEADSETS – A BUYING GUIDE

So just how do you go about choosing the right headset for you?

When you learn to fly, chances are you will use the standard club-issue headsets. Sooner or later, though, you will probably wish to invest in a pair (or pairs) of your own. Apart from the obvious matter of hygiene (shared headsets may transmit colds and flu, or ear infections), a headset is a personal choice, taking into account factors such as Comfort, Compatibility and Cost.

Comfort

Weight is a major factor here. In general, the lighter, the better, but bear in mind that lighter construction may offer less passive noise reduction than heavier models. Passive attenuation is the description applied to the ability of the headset to block-out noise (i.e. by getting between the noise and your ear), and it is partly a function of the size of the ear cups, so in general the larger the ear cups, the higher the noise reduction. Larger ear cups can also add bulk and weight, however. Some designs, particularly "budget" designs derived from old-established models, also rely on a "Head-clamping" effect to produce a good ear-seal and appropriate passive attenuation ratings. This may make them less comfortable on flights of longer than about an hour.

Most modern passive models will offer a noise-reduction rating (NRR) of around 20-24 Decibels (dB). As a guide, a 3dB reduction equates to an effective halving of the noise energy at the ear. (This is not the same as a halving of the subjective loudness, however.) The higher the number, the quieter the headset, but bear in mind that a slightly less quiet, but more comfortable headset may prove a better buy if you regularly conduct flights of longer than 1 hour. If possible, "Try before you buy." Your flying club may be able to obtain your shortlisted models from AFE for you to try – why not ask them? Alternatively visit our pilot shops at Oxford or Manchester where our sales staff will be pleased to give demonstrations of the models we stock, advice and assistance.

When you know what you want, our mail-order service is quick and convenient either online, or by phone.

Cost

Here, you must decide for yourself how much you wish to spend. If you fly regularly, and spend long periods "inside your headset" then you would be well advised to spend a little more money on your choice. Budget headsets may be broadly defined as those costing under £120. At this price, performance can be very good (we don't have any duffers in our range, at any price) but there may be compromises in respect of long-term comfort, or clarity. By £150 much of the cost-cutting has gone, and the headsets we feature from here to about £200 will offer truly good value. Over £200 we are entering the realm of "Professional" headsets, designed to withstand the rigours of a professional pilot's life. If you fly regularly, the extra cost of these models may be worth considering. Bear in mind that, from time-to-time, certain brands of headset may be offered at promotional prices. Don't discount a headset from your consideration just because it is less expensive. We are always happy to give advice, based on specific requirements.

Passive, or ANR?

The prices above refer to conventional “Passive” headsets, which rely on a physical barrier to block sound. “Active” or ANR (Active Noise Reduction) headsets use electronics to further reduce the level of noise which enters the ear by sampling the ambient noise, inverting this waveform and re-broadcasting it directly through the headset speakers where it helps to cancel out the original noise. This can result in an effective doubling of the passive level of sound attenuation, but only over a relatively small frequency band. ANR headsets work best at frequencies below about 400-450 Hertz. This represents the normal frequency range for speech, and also much propeller and exhaust noise is in this region. ANR headsets are therefore a significant advantage where intelligibility of transmissions is affected by engine and prop noise, and they offer greater hearing protection in high-noise environments. They will do little to reduce noise at higher frequencies (e.g. airflow noise) however. This is generally regarded as an advantage, because changes in slipstream noise can give subconscious clues to, for example, reducing airspeed or approaching stall. ANR headsets may sometimes have difficulty operating properly in open-cockpit situations, which may also include flight with open windows and doors (aerial photographers and para-drop pilots take note).

ANR headsets cost typically about twice as much as their passive equivalents. They also require a power supply, which may be a simple 9V battery box, or a more complex panel-mounted dedicated power supply. Headsets which use a panel-mount power supply have the advantage of needing no external batteries, but the ANR circuitry will not work in an aircraft without the necessary power connector installed. Headsets with a battery power supply are more universal, but depend on having a charged battery. Some designs, e.g. Sennheiser and the modular David Clark “XL” models, can be both, but this will require a small amount of additional hardware be carried.

ANR headsets will still work as passive headsets, even if they do not have power to the ANR circuit, so if the ANR power quits, you’ll still be able to communicate through your headset, it will just be a little noisier!

Noise-cancelling

Not the same as *Active Noise Reduction* (see above), *noise cancelling* refers to the fact that most microphones fitted into headset booms are double-sided. They pick up sound from the mouth-facing side, and from the outward-facing side. They then compare the signal from both sides and reject it if it is the same. That way, the ambient noise in the cabin is not merely picked up by the microphone and re-broadcast inside your headset. When you speak, the speech is only picked-up by the mouth-facing side of the microphone, and this signal is passed to the intercom.

Electret or Dynamic microphones?

Dynamic microphones use an operating principle similar to traditional telephone microphones. Sometimes called “Amplified Dynamic Microphones” they consist of a microphone transducer with a small inbuilt amplifier to bring the low-power signal up to sufficient voltage level to be accepted by the aircraft intercom. Dynamic microphones are generally described as “low-impedance” designs. Nowadays, dynamic microphones are most commonly found in military applications, older types and helicopters.

Electret microphones use a more modern, piezo-electric, principle to generate an electrical signal from the incoming sound. They do not require pre-amplification, but have a much higher input impedance. Most modern fixed-wing headsets are fitted with electret microphones.

The aircraft intercom will normally be configured to accept signals from either electret or dynamic microphones but may not accept both without complaint. This is a fairly common source of *headset incompatibility*, (see below). In these circumstances, when an intercom is receiving signals from both a high-impedance (electret) microphone, and a low-impedance (dynamic) microphone, the low-impedance microphone will tend to receive the greater part of the intercom bias voltage (the power supplied by the intercom, to drive the microphone) and the high-impedance microphone may not receive enough current to operate properly. As a rule of thumb, you should try to avoid using headsets with different microphone types connected at the same time. Two different brands of headset which both use electret, or both use dynamic, will not normally cause problems, however. It is the microphone type, not the headset brand, which is the most important factor.

Compatibility

There are no definitive answers here. It is not possible to say “Headset X is compatible with headset Y” or “Headset A will not work with headset B.” Compatibility rests in large part with the aircraft radio and intercom installation. We may be able to give general advice, but specific installations vary.

A good test: if, while flying with two different headsets, one headset does not work properly, disconnect the WORKING headset at the plugs. If the NON-WORKING headset now springs back to life, the problem is one of incompatibility. If it does not, this would indicate that there is a fault with the headset itself.

Faults

The most common fault in headsets, especially intermittent faults, is due to dirty plugs. If your headset does not work, or works intermittently, and compatibility is not suspected (see above) then lightly clean the plugs with a normal gentle metal polish. If the fault persists, contact your service agent, or supplier for assistance, if the fault is cured, congratulations! You just saved yourself a £30 inspection charge!

The second most common fault is caused by intermittent connection at the plugs, due to damage where the cable joins the plug body. Usually this has been caused by users taking hold of the cable, not the plug body, to disconnect the headset at the end of the flight. If you treat the headset carefully, this shouldn’t occur. Many quality headset brands incorporate extra-long plug leadouts and reinforcement at the plug-end of the cable. This also serves to reduce this problem. Note that warranties usually cover faulty parts or workmanship, and will rarely cover the cost of repairs due to misuse of the type mentioned above.

Some headsets have both stereo and mono capability, and usually offer the opportunity to select between these two. If the aircraft intercom is a mono design, a stereo headset will have one “dead” earcup. The cure is simply to switch to “mono” for that type of intercom. This is not strictly a fault, then, but is still a common problem reported to us. Easily fixed, in this case, however.