Active Noise Reduction in Helmets

How a trusted technology can save your life

eBook

LIGHTSPEED®

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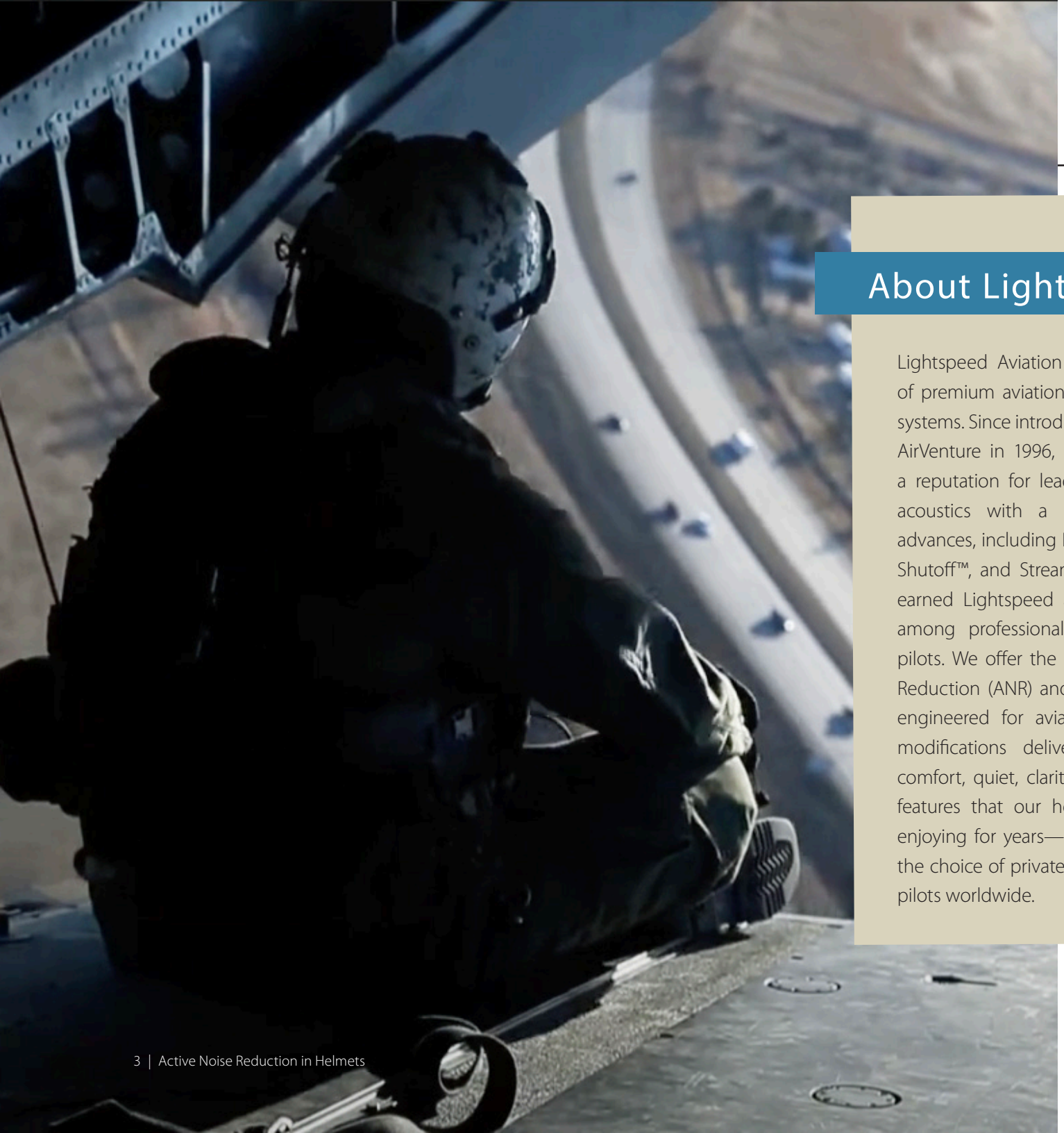

About Lightspeed

Lightspeed Aviation is a leading manufacturer of premium aviation headsets and helmet ANR systems. Since introducing its first product at EAA AirVenture in 1996, Lightspeed has established a reputation for leading innovation in aviation acoustics with a number of first-to-market advances, including Bluetooth® integration, Auto Shutoff™, and Streaming Quiet™ ANR. This has earned Lightspeed a loyal customer following among professional, commercial, and private pilots. We offer the only premium Active Noise Reduction (ANR) and audio solution specifically engineered for aviation helmets. Our helmet modifications deliver remarkable Lightspeed comfort, quiet, clarity, plus all of the advanced features that our headset wearers have been enjoying for years—which is why Lightspeed is the choice of private and professional helicopter pilots worldwide.

"I've had other ANR types in helmets and they frankly don't work nearly as well as the Zulu H-Mod works, because you guys designed this for the helmet, and nobody else has."

– Barry Hancock
Chief Pilot: Pilot Maker Advanced Flight Academy

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Can your helmet comms pass the test?

6 questions to ask before upgrading your helmet comms

It happened countless times. Lightspeed would be exhibiting at a trade show and customers would ask us when we were going to make a Lightspeed system for helmets. Sometimes, they would even show us how they had taken apart a headset and installed the components into their personal helmet. Responding to this neglected segment of hard-working aviators, who choose to, or are required to, wear a helmet motivated us to design and build a system specifically for aviation helmets.

Working with many pilots and experts, our design team focused on the comfort and features requested most by the pilots we surveyed. In 2016 the first Zulu H-Mod systems began shipping, and about a year later we released the second product, the LSA 56, developed in conjunction with Gentex specifically for the HGU-56/P helmet. The following is a list of the top six criteria we found important, and things to look for when you are considering your next helmet communication installation.

Does the system have Active Noise Reduction (ANR)?

A breakthrough technology that is particularly helpful in reducing fatigue, noise induced hearing loss, and improving communications, ANR is a must for today's aviators. Lightspeed has been producing ANR headset systems in aviation (piston and turbine environments) since 1996, and now a mature technology, it has proven to be a factor in safer, more comfortable flying.

Is the system purpose built for aviation helmets?

As we mentioned earlier, there is a temptation to install a "deconstructed" headset into a helmet. While inventive, this creates a series of other problems including poor fit and comfort, non-optimized ANR, and an abandonment of the manufacturer's warranty. Both Lightspeed ANR for helmet systems were designed for this specific application. The fit and comfort were among the biggest challenges. A system inside a helmet does not rest on the head and ears the same way a headset does.

Is the installation done by a certified installer?

Getting the installation just right is a key to ensuring the system has the performance and longevity you expect. Lightspeed has hand-picked a global team of skilled technicians and helmet experts and certified them to install and service the systems we sell. You can rest assured that the job will be done well, and someone will be there to help you through any issues that occur post purchase.

Is Bluetooth integrated?

In its early days, Bluetooth may have been viewed as a frivolous feature that pilots in a busy environment would not use. Today, however, it is a vital way to receive alerts from navigation apps and provide an excellent back communication source. Having this built right into the system provides these benefits with no additional components, cables, connections, etc.

Has it been designed for a safe egress in the event of an emergency?

One of the most important features unique to the helmet application is the need for an emergency egress. Lightspeed engineers developed a beautifully integrated "quick disconnect" that will automatically break free ensuring that you and your helmet exit the aircraft with no noticeable drag from the connection to the panel.

Does the manufacturer endorse and warranty the product?

Last, but certainly not least, a deconstructed headset from any brand installed into a helmet has voided the warranty. The installer may or may not offer a supplemental warranty but recognize that if it is not backed by the manufacturer, you may have no warranty at all. The factory warranty on the Lightspeed ANR for helmet systems is 3 years.

If you can solidly answer yes to all six of these test questions, you know that you have a premium ANR system for helmets that is purpose-designed by Lightspeed for any demanding task your work requires. Don't fall short on what comms you rely on in your helmet.

"I have ANR and Bluetooth inside my helmet, I can talk on the phone and get perfect clarity, and I also can listen to music while I practice so that's important to me. It's really comofratble, sounds great, great quality all around."

– Aaron Fitzgerald
Red Bull Helicopter Pilot

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Do I need ANR in my helmet?

For many of us that learned to fly a long time ago, we became quite happy with a comfortable pair of passive headsets or standard comms in a helmet. Then Active Noise Reduction (ANR) came along in the 1990's, and not everyone was convinced it was actually better in the cockpit than passive noise reduction.

Fast forward 25+ years – the technology has now matured and has proven itself to provide a variety of benefits that really do improve the flying experience.

Let's examine a few of those:

Noise reduction in both piston and turbine environments

ANR is particularly good at reducing low frequency noise, and there is a substantial amount of low frequency noise in both piston and turbine aircraft.

Clearer comms

With much of that low frequency noise out of the way, it is much easier to hear the comms clearly. This mitigates the need to turn up the volume on comms so that they are louder than the noise. This in turn provides a genuine savings when it comes to noise induced hearing loss.

Less fatigue

Studies have shown that by reducing the monotonous low frequency drone in the aircraft, there is a measurable reduction in fatigue. We know this leads to fresher, better decision making.

Mechanical anomalies are more noticeable

One of the concerns we sometimes hear from pilots is that they will not hear mechanical anomalies that could warn of an impending problem. Interestingly, the opposite is actually true. Because the background noise is reduced, any acoustic anomaly is actually more noticeable when ANR is present. You can read anecdotal stories of this from pilots on various aviation forums and blogs.

Enhanced features

Lightspeed ANR systems for helmets have integrated Bluetooth and a Quick Disconnect. In its early days, Bluetooth may have been viewed as a frivolous feature that pilots in a busy environment would not use. Today, however, it is a vital way to receive alerts from navigation apps and provide an excellent back communication source. Having this built right into the system provides these benefits with no additional components, cables, or connections.

To facilitate a "hands free" emergency egress, Lightspeed ANR systems for helmets include a beautifully integrated "quick disconnect" that will automatically break free ensuring that you and your helmet exit the aircraft with no noticeable drag from the connection to the panel.

Better comfort

With a proper fit, ANR systems can rest more lightly on the ears due to the fact that it is the electronic signals that are doing much of the noise reduction, not a strong clamping force. This leads to a much more comfortable fit. Lightspeed ANR systems are also designed with the human ear in mind, and the shape of the cups and assemblies are designed for maximum comfort.

Premium materials

High quality parts and manufacturing processes are used throughout the system, but the most notable component is the unique Kevlar reinforced cables used in the Lightspeed systems. We introduced these cables in 2015 in our most expensive headset and have since migrated most of our products to these cables due to their extreme superiority in the field. They are the epitome of rugged, durable, and flexible.

Do you need ANR in your helmet? Of course not, BUT you will enjoy your flying much more immensely with it and will benefit from some of the on-board safety features that are also part of an upgrade.

"Everything goes quiet, the engine, the outside air, is all just kind of muted down. Like way down. Lightspeed knocked it out of the park with this modification."

– George Ford
Outside Wingman Pilot

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How helmet modifications work

A simple 3-step process

OK, you have decided to upgrade to a fully-featured, ANR communication system in your helmet – now what?

Step one: The Helmet

Are you buying a new helmet or retrofitting an existing one?
A Lightspeed ANR system can be installed into either a new or existing helmet. Lightspeed has crafted a network of dealers and installers to offer a wide variety of helmet brands and models that your ANR systems work well with. Most of today's common and preferred models can be found offered by someone in this network.

Step two: The ANR

Identify the brand and model of the helmet you have or want. Once you have narrowed down the candidates for the helmet itself, select which of the two Lightspeed products is best for you. If you have a Gentex HGU-56/P helmet, there is a product we jointly developed with Gentex that is the solution for that helmet. For all others, the universal Zulu H-Mod is the correct solution. As with our history of premium active noise reduction in our headsets, both ANR for helmets solutions provide the same clarity you expect to come from Lightspeed.

Step three: The Install

There is a global network of carefully screened and trained and certified installers that are equipped to do this type of work.

The installer will probably have you take a few measurements of your head to ensure you get the best overall fit including the ANR system.

As you know, helmet style and fit are very personal to each individual. So, getting the right measurements and adjustments from the beginning of this process are key to getting you what you need.

Once installed, you will enjoy years of improved comfort, noise reduction, audio clarity and features with the full confidence of knowing that Lightspeed is backing up the product with a factory authorized three-year warranty.

"I fly the Bell 212 on fires, it's a very noisy helicopter and I have to monitor four different radios. (A recent campaign) had up to 70 aircraft flying on it, the radios comms were extremely difficult and the Lightspeed Zulu H-Mod makes it clear, easy to understand, and way less fatigue at the end of a long day of flying."

– Eric Ridington
Bell 212 Fire Pilot

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How Your Helmet's Comms Connection Can Save Your Life

Anyone who's accidentally gotten out of a cockpit with their helmet on knows how strong the comms line connection to the airframe can be. (Of course, this has never happened to you, but it might have happened to someone you know.) In fact, a direct-to-airframe intercommunication system (ICS) cord connection typically takes 70 pounds of pressure to disconnect, and that resistance can make the difference between life or death in an emergency situation, when a pilot needs to get out of the aircraft fast. That's why the military has for years required an ICS cord configuration that allows the helmet to disconnect quickly and easily for quick egress, and why civilian pilots need the same.

Why Standard ICS Connections Impede Egress

The issue is that helmet cord connections with the airframe are contrary to the direction of egress as shown in these two photos. The ICS cord plugs are typically parallel with the airframe, as shown in the photo below, or located above the pilot and perpendicular to the angle of egress, as shown on the right.

When Seconds Count

In an emergency situation such as a ditching, fire, or water landing, seconds count. As Dudley Crosson, flight safety instructor at Delta-P, says "Everything happens so fast. You're trying to get out.

You're worrying about other people in the aircraft. Disconnecting the cord is such a trivial process, but people have been hurt severely because they couldn't get out. They thought they were tangled, but they weren't. The helmet cord was just pulling at the wrong angle."

When an aircraft is going down, the helmet protects the pilot's head and neck, and it provides some flotation in a water landing or ditching situation. But trying to disconnect the helmet's ICS cord during an emergency exit, especially if there is water or smoke in the cockpit or if the pilot is injured, can cost precious time.

In fact, the NTSB has documented at least two incidents where direct-to-airframe connections impeded egress. In both cases, helicopters went down in water, and in both cases, subsequent investigation showed that the pilots were impeded in exiting the aircrafts by their helmet cords. One was able to remove his helmet and surface. The other escaped after pulling so hard that the end fitting on the cord was fractured. After post-accident testing, NTSB investigators concluded that fracturing the connections took 70 pounds of force. Adrenaline is a powerful thing, but this is more force than a drowning, injured, or disoriented pilot might be able to exert.

You can see other features of Lightspeed **Zulu H-Mod** and **LSA 56ANR** helmet systems at **LightspeedAviation.com** and find an installer to fit your helmet with the right ANR system for you.

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