



Clarity Aloft™ Aviation Headset Owner's Guide



Table of Contents

Cautions and Advisories	page 1
Hearing Protection	page 2
Abbreviated Instructions – Quick Tips	page 3
Do's and Don'ts	page 5
Storage	page 6
Using your Headset	page 7
Troubleshooting	page 15
Technical Information	page 16
Warranty Information	page 20



Cautions and Advisories

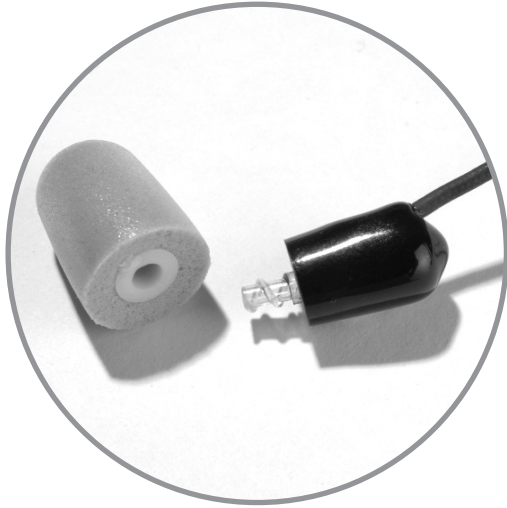
The Clarity Aloft™ Aviation Headset provides the highest degree of sound and noise attenuation in any hearing device available today. Never wear the Clarity Aloft headsets with the ear pieces inserted when hearing surrounding noises is important. For example, when starting the engine, the pilot should have the headset in place on the head but with only one ear piece inserted in the ear. This will allow the pilot to still hear necessary sounds such as yelling outside the airplane, or unusual engine noises when the engine is being started. After the engine is started, the second ear piece can be inserted into the other ear. When used in flight at very high ambient noise levels, the Clarity Aloft headset will also make some noises more noticeable.

Changing tips – Be sure to replace the flexible Comply™ Canal Tips whenever they appear soiled, or contaminated. Also be sure to replace the tips whenever the headset is to be used by another person. Use the enclosed order forms to purchase a new supply of tips when necessary. Let how often you fly and good hygiene be your guide to replacement.

Because the headset eliminates most of the high noise levels that masks common sounds, some sounds will sound more audible, such as stall horns, gear warning horns, propellers out of sync, or engine vibrations and may cause initial concerns until the pilot becomes used to the phenomena of better hearing. Hearing these sounds more clearly improves flight safety by eliminating the masking of critical sounds by high background noise.

Sound of one's own voice – You may find that when you speak into the headset with the earpieces inserted, your voice sounds deeper than normal. This is due to the seal with the ear that keeps the sound of one's own voice in the ear canal. The sound of your voice over the intercom or as heard on the radio will be normal and very high fidelity.

Hearing Protection



The patented Comply™ Canal Tips used in Clarity Aloft headsets provide the highest level of protection from high levels of surrounding sound available by any practical method. By preventing sound from entering the ear canal, and then delivering desired sound directly into the ear canal, between 35 and 45 dBA of noise reduction is available over a very wide frequency range. Instead of losing effectiveness in the speech frequency range of 400Hz to 4,000HZ, the Comply Canal Tip method dramatically reduces those sounds in the speech range that can damage hearing and interfere with communications. The result is better hearing protection and much clearer sound quality in the speech frequencies than can be achieved with any other headset. See the specifications chart for attenuation by frequency under the Technical Advantages section.

Abbreviated Instructions – Quick Tips

Aloft Technologies recommends that each user read through the Owner's Guide thoroughly for complete instructions before initial use. The abbreviated instructions included with each headset are labeled as Quick Tips.



Step 1

START WITH CLEAN COMPLY™ CANAL TIPS

If needed, replace when soiled or with a new user.

See Owner's Guide for instructions on changing the canal tips.



Step 2

CORRECT ORIENTATION

Hold the headset in front of you with the correct orientation. The headset band is worn **BEHIND THE HEAD, NOT OVER THE HEAD**. The Clarity Aloft headset is **NOT** worn like a traditional clamp-type headset.



Step 3

GETTING READY

Before inserting the earpieces, turn on the sound of the aircraft radio to your customary setting, at a comfortable loudness level. You can test **AIRCRAFT RADIO VOLUME** with one earpiece inserted even loosely. Follow the correct insertion procedure as described below **AFTER** adjusting the aircraft radio.

Quick Tips – continued

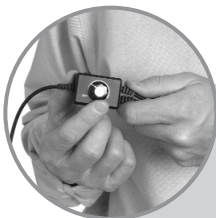
Correct placement of the Earpiece deep into the ear canal assures the full sound dampening (attenuation) to 35-45 dB. This insertion procedure assures both clear sound as well as the hearing protection needed in high noise environments.



Step 4

INSERTING THE EARPIECES - For both left and right ears:

1. Compress the foam by squeezing or pinching between your fingers.
2. Use your opposite hand positioned behind your head to open the ear canal.
3. Pull back and out firmly on your ear to open and straighten the outer ear canal.
4. Gently insert the entire tip, like a key in a keyhole. Release your hold on the ear.
5. Hold the tip in place 15-30 seconds until the foam expands.



Step 5

TURN UP THE SOUND

Turn up the sound gradually on the (Clarity Aloft) headset volume control to a comfortable loudness level.



Step 6

AFFIX THE STRAIN RELIEF CLIPS TO YOUR APPAREL.

Changing the Comply Canal Tip:

1. Use clean hands.
2. Unscrew the old tip and discard it.
3. Screw the new tip on securely.

Comply™ Canal Tips are frequently used by hearing aid users. People who use the canal tips on a daily basis find that one pair of tips will last for one month. Thus, the starter package of 6 pair is estimated to last for 6 months. Keeping the tips clean and free of ear wax will extend the useful life of the Comply Canal Tips.

Do's and Don'ts



DO ask an Aloft Technologies representative if you have any questions or problems.

DO change the Canal Tips frequently. Clean tips perform better.

DO change the Canal Tips between users. They are a personal item.

DO insert the earpiece far enough inside the ear canal so that the foam is no longer visible outside the ear. This will ensure complete hearing protection and fullness of sound clarity.

DO be comfortable.

DO choose the right size of Canal Tip for you.
(Standard or slim)

DO discard the old tips out of the reach of children.

DON'T leave your headset in the direct sunlight and heat for extended periods.

Storage

The Clarity Aloft Aviation Headset is built to rugged military standards, but remains a sophisticated electronic device that requires the same treatment and storage as all high quality electronic devices. Store the headset in a dry, cool place, and never leave it sitting in high heat in direct sunlight. When kept in the aircraft, most pilots find it convenient to drape over the yoke, or place on the back of an unused seat, provided intense sunlight will not hit them directly.

Getting your headset ready for use

After unpacking your headset, open the package of Canal Tips, and select two tips to screw onto the headset speakers. The standard tips fit 80% of users. Most people choose to reorder the 12 tip package in the “Standard” size. One pair of Slim tips is included for people with smaller ear canals. If the Slim tips fit better, simply email or call us and we will exchange the package of 12 Standard tips for a package of 12 Slim tips.

The Clarity Aloft headset does not use batteries, so there are no batteries to insert or replace.

When you plug your headset into the aircraft jacks, be sure the volume control is turned to the lowest position. Set the aircraft radio and intercom volume controls to a normal position and then increase the volume control on the headset to a comfortable level. When used with an intercom, be sure to listen for the sound of your own voice. When you can hear your voice in the ear pieces, others can also hear you.

Using your Headset

Wearing it Properly



The Clarity Aloft Aviation Headset is the most comfortable headset available in aviation today, yet its comfort can be enhanced by proper usage.

The “featherweight” construction used in the headset depends upon the loops over the ears to position and hold the boom microphone securely in place in front of the mouth. The headband does not need to fit tightly on the back of the head to ensure microphone stability. Be sure the headband is placed behind the head and over the ears, not over the top of the head as is done with many headset systems. If

you prefer a closer fit, an adjustment band is included in your purchase. See the instructions on page 8 for guidance using the adjustment band.

The tension clips on the main cord are there to relieve strain from the headband. Simply clip them onto a convenient part of your clothing to take weight off the headband.

Using your Headset

The Adjustment Band

To Put the Adjustment Band on the headset frame:



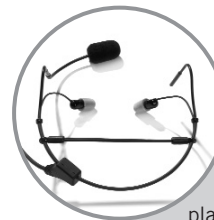
Step 1

Adjust toggles toward each other to create a wide loop, making sure the loops are wide enough on one side to go over the microphone cover.



Step 2

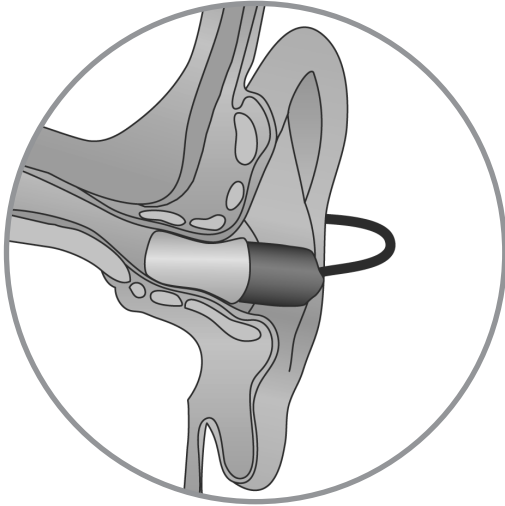
Slide the band loops over the headset frame on both sides and place in the desired position. The adjustment band can be positioned at any point on the frame.



Step 3

Tighten the toggles against the frame to secure the band in place to produce a tighter fit. Readjust as necessary. If tightened properly, the band should not shift from the frame during use.

Refer to the pictures to see how the adjustment band looks after application to the frame. If you have any remaining questions, please contact us at (612) 747-3197 or by e-mail at service@clarityloft.com



The outstanding noise reduction of Clarity Aloft headsets depends upon a snug seal with the ear canal by the Canal Tip devices. To achieve a proper fit requires some practice and we recommend the following:

1. Compress the foam by squeezing or pinching between your fingers.
2. Use your opposite hand positioned behind your head to open the ear canal.
3. Pull back and out firmly on your ear to open and straighten the outer ear canal.
4. Gently insert the entire tip, like a key in a keyhole. Release your hold on the ear.
5. Hold the tip in place 15-30 seconds until the foam expands.

Carefully following the above procedure will ensure the full sound dampening and a more comfortable fit.



The human ear comes in various sizes and shapes, and the patented Comply™ Canal Tips come in sizes to fit all ears. The standard size supplied with the headsets fits most ears. **ALWAYS TRY THE STANDARD SIZE FIRST.** If they are too big for comfort in your ear canal, then try the one pair of Slim tips included in the case. The seal formed by the viscoelastic foam inside the ear canal is the key to the hearing protection and noise reduction of the Clarity Aloft headset. If you feel that you haven't been experiencing the best possible hearing protection and noise reduction, please contact us. We will find a tip size that will work for your ear canal.

Tip Replacement

Replace the tips whenever they look soiled or when another person will be using the headset. A snug seal with the ear canal is necessary for proper sound reduction and accumulations of ear wax can interfere with the seal. The life of the tips can be extended by washing them in water with a very mild soap. A re-order form has been included with this guide to allow fast and simple re-ordering of a fresh supply of tip



The noise canceling microphone used in the Clarity Aloft headset is a high fidelity noise canceling Electret Condenser microphone with performance optimized for speech frequencies in extremely high noise environments. For best performance, adjust the flexible boom to place the microphone as close to the left corner of the mouth as possible. In addition the raised black arrow to the left of the foam mike cover should be placed towards the mouth. As with all noise canceling microphones, placement close to the mouth is important to produce the high signal-to-noise levels needed in

high noise environments. Once placed correctly for your personal configuration, the boom microphone should stay in place adequately for all communication functions.



When the headset is first used, the volume control should be placed in the Min position then adjusted after assuring that the aircraft radio and intercom volumes are adjusted to comfortable levels. The Clarity Aloft™ headset delivers sound directly into the ear canal, so if levels are set too high, very loud audio will be heard until the levels are adjusted properly. If no sound is heard from the headset, the cause is usually either:

1. The Volume Control is set at Min or,
2. The user has forgotten to insert the ear pieces. (The headset is so comfortable, users do occasionally forget to insert the earpieces)

The Clarity Aloft Stereo Headset is also equipped with a balance control to adjust the balance between the left and right speakers. Since the balance control will be used infrequently it has been located within the volume control box and is accessible through the hole on the side with a small screwdriver. The balance is set to neutral at the factory, but may be adjusted left or right to suit your hearing preference.



The Clarity Aloft Stereo Headset is also equipped with a music input in the volume control box that will accommodate most music devices through a 1/8 inch plug. Be sure that the volume of the music device is set at minimum before connecting to the headset.

Caution! There is no “mute” function included in the music input, so be certain that the music level does not interfere with radio communications. If there is any question of interference with radio communications, do not use the music input on the headset.

Using your Headset

Replacing Parts



Microphone Foam: The foam cover over the microphone is a wind-screen intended to prevent wind noise or breathing noise from entering the microphone. It is especially important in high wind situations such as open cockpit aircraft. If the foam is lost or becomes soiled and needs replacement, contact Aloft Technologies through our website at www.clarityaloft.com or secure a replacement from a local supplier of microphone accessories.

Comply™ Canal Tips: When the tips become soiled or another person wishes to use the headset, unscrew the tips and replace them with fresh ones. Be careful to screw the tips on snugly, but do not over-tighten and strip the threads on the post. When a new supply of tips is needed, either re-order with the enclosed order pad or contact Aloft Technologies by phone, mail or website (www.clarityaloft.com) and order a new set of replacements.

Troubleshooting

Clarity Aloft headsets are designed for many years of trouble-free service. As with all high-performance electronic devices, the headsets do require normal care and handling. Some common problems and solutions are:

Noise and Static in the earphones – Occasionally the connection between the headset jacks and the aircraft jacks may be erratic. Many aircraft jacks have not been replaced over twenty or more years and have developed poor connections. If noise is heard, first clean the jacks with a cleaner such as “Tuner Cleaner” available from consumer electronics stores. If noise continues to be a problem connect another headset to the jack to verify whether the problem is with the headset or the jack. If the jack is verified to be the problem, contact a certified Aircraft Electronics shop to replace the jack. Consider replacing all of the jacks if one has a problem, since they are probably of the same age and condition.

No sound in the earpieces – The most common causes are, either the volume control is set at “Min” or the plug is not securely inserted into the aircraft jack. After eliminating these causes, verify that the jack is supplying sound audio by testing with another headset. If the problem persists, contact Aloft Technologies™.

Microphone sounds “broken up” on the intercom – This is usually caused by either microphone placement too far from the mouth or the intercom “Squelch” control being improperly adjusted. Remember that on the intercom, others can hear you only if you can hear yourself.

Headband is too tight or too loose – A tight fit of the headband is not necessary for holding the microphone boom correctly in place. The boom stability is produced by its fit over the left ear, not the tightness of the headband. If the headband feels too tight or too loose it can be safely bent by grasping it with two hands and bending together or apart as desired. The headband can be bent many times for adjustment without damage. The Adjustment Band may be used for a closer fit. See the Adjustment band section for more details.

Technical Information

The Technical Advantages in Clarity Aloft Aviation Headsets

Most pilots at one time or another find themselves in critical need of clear communication to control towers and other aviators. The Clarity Aloft system has a distinct advantage in both speech reception and speech transmission. It should be noted that the advanced technology present in the Clarity Aloft headsets allow for both comprehension of clear sounds and hearing protection as well as the clearest delivery of speech sounds most needed for accuracy of communication. The technical information makes it clear why this is true.

Speakers

The speakers used in Clarity Aloft headsets are derived from the highest quality dual balanced armature transducers (speakers) used in a variety of very expensive hearing aids. They are designed for very flat frequency response over a wide frequency range. Specifications for the speakers are:

Impedance	270 Ohms +/- 15% per speaker measured with a 400 mV RMS 1000Hz input.
Temperature Range	-50 degrees F. to +160 degrees F.
Cable Flexing	Tested to 25,000 flex cycles without failure
Audio Output	85 dBA of audio output with a 400mV input at 1000Hz
Frequency Response	Output level +/- 5 dB from 300Hz to 4000Hz with an input level of 400mV

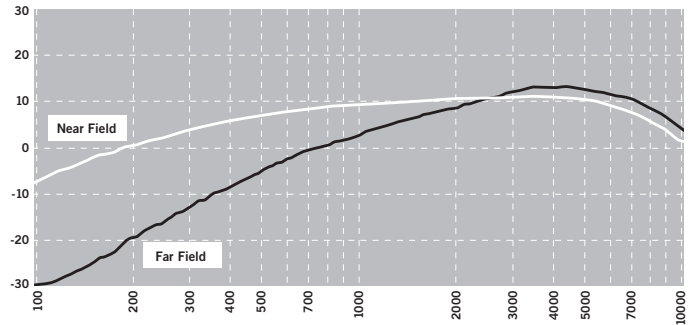
Technical Information

Microphone – Specifications:

Generating Element	Electret Condenser
Directional Property	Noise Canceling
Frequency Response	100 Hz to 10 kHz
Sensitivity (1 kHz and 1 Pa at 1/4th")	-33 to -23dB ref 1Vrms
Maximum Input SPL (< 5%THD)	> 125 dB (12V bias)
Bias Voltage	8 - 16 VDC
Rated Load Resistance	220 Ohms
Rated Bias Resistance	470 Ohms
Output Impedance (@ 1kHz)	100 Ohms(DC), 140 Ohm(AC) (+/- 20%)
Operating Temperature	-4°F to +158 °F

The chart below illustrates that the Clarity Aloft microphone has distortion free, flat frequency response that produces clear audio over the entire range of speech frequencies. The audio output of this microphone far exceeds the capabilities of most other aviation microphones.

Frequency Response



Technical Information

Comply™ Canal Tips

The patented Comply Canal Tips were initially created for the communication needs of hearing aid users. This advanced technology has been adapted for use in aviation by Aloft Technologies under the guidance of Dr. Bob Oliveira, who developed the technology. The tips are made of viscoelastic polyurethane foam with characteristics based on scientific research and development conducted by Hearing Components, Inc. in Oakdale, Minnesota. They are licensed under U.S. Patent nos. 4,880,076 and 5,002,151 and their international equivalents.

These tips have unique capabilities that transfer well to aviation needs. For example, the Comply Canal Tip is designed to be squeezed, inserted in the outer ear canal and allowed to expand slowly at body temperature, conforming precisely to the outer ear canal of each user. Most aviators are already familiar with the simple foam earplugs used for hearing protection around airports or other high noise environments. Although the customary use is similar to those simple foam earplugs, the performance characteristics of the Comply Canal Tips are dramatically better.

The viscoelastic foam used in the Comply Canal Tips provides what is referred to as Viscoelastic Passive Noise Reduction, (VPNR). Tests by the U.S. Army have proven that this unique method of noise reduction (VPNR) results in better hearing protection and better noise reduction than can be achieved with Active Noise Reduction. The chart below gives data for the VPNR provided in Clarity Aloft headsets.

Passive Noise Attenuation for Clarity Aloft™ Aviation Headset

Frequency (Hz)	125	250	500	1000	2000	3000	4000	6000	8000
Attenuation (dB)	29.7	34.2	39.7	42	38	43.2	43.5	47.5	46.1
Standard Deviation	5.3	5.9	4.7	5.1	3.2	3.2	3.5	4.5	4.4

Real-ear attenuation characteristics of the Clarity Aloft system per ANSI 83.19-1974 using standard and slim size eartips. Tests were conducted by Aearo Company's EAR CAL Acoustic Laboratory. NRR per EPA 1979 is 29.5 dB.

Technical Information

In addition, Clarity Aloft headsets have a superior method of transferring sound to the ear by means of the critical sound pathway in the tip. The sound comes from the transducer which was carefully selected to achieve the highest quality in sound available today. The Comply Canal Tip is easily detached from the speaker by a simple threaded screw mechanism.

Also, it is important to note that the viscoelastic foam maintains its excellent seal throughout a variety of movements and activities. When the tip has warmed up while in the ear, it will maintain a snug but comfortable seal while a person talks, turns, laughs, or even chews. Two abstracts co-authored by Dr. Robert J. Oliveira reference the importance of the otoplastics materials used in the Comply Canal Tips.

These abstracts explain how the research was conducted as well as how the ear canal anatomy and activity influences the measurement of VPNR. Dr. Oliveira is a frequent presenter and guest speaker on this topic. Dr. Oliveira has over 12 patents and has published over 30 articles or chapters on topics related to the human ear canal. He has been an elected member of the Board of Directors of the Hearing Industries Association as well as an elected Board Director for the American Auditory Society. The basic research used to define the activity and geometry of the ear canal was funded by four Small Business Innovative Research grants by the National Institutes of Health. For more information, reference the web site of Hearing Components, Inc. at www.hearingcomponents.com.



www.clarityaloft.com

Aloft Technologies
16364 84th Avenue North
Maple Grove, Minnesota 55311

Customer Service
612-747-3197
service@clarityaloft.com