

# Active Headsets

INCORPORATED



## Active Noise Reduction Module™

### Installation and Operating Instructions

For installation into Gentex, MSA/Gallet and Alpha Helmets  
Models: SPH-3, SPH-4, SPH-5, HGU-33, HGU-55, HGU-68,  
HGU-84, LH-250, LH-350, Alpha Eagle

Rev. 04-09-15

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## Generic Instructions

These instructions are intended to apply to most brands of aviation helmets in use today. For installation into Alpha or MSA/Gallet helmets you may need to contact us for additional tech support at 806-358-6336 or 800-876-3374.

## Caution

**Read these instructions completely before beginning the installation. The anr modules are finely tuned & require that installation be performed strictly in accordance with this manual. Deviations from the instructions contained herein will result in a system malfunction. Purchaser assumes all risks arising from an improper installation.**

**This product is intended for "self" installation into your helmet and requires reasonable skill in the use of a soldering tool but a minimal understanding of electronics. If you question your ability to perform the installation, you are advised to take this unit & your helmet to the nearest electronic technician, or ship them to HEADSETS, INC. for a factory installation. Any radio/tv technician or avionics technician should be able to install the modules in approximately 3 hours.**

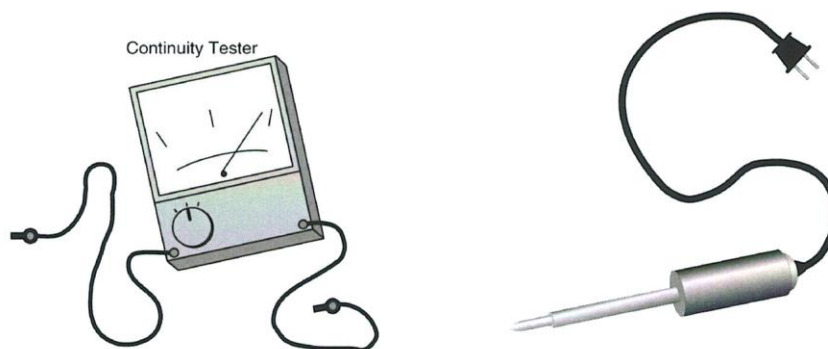
## Parts List

### Check to see you have received all materials

- 1 pair modules** (2 modules) - marked R & L. Each module contains an anr speaker, audio speaker, microphone and circuit board.
- 1 pair silicone gel earseals** - designed specifically for helmet type earcups in order to optimize anr performance and comfort.
- 1 battery case** - Sliding door permits easy access to the 9v battery.
- 1 power cable** - 72 inch, 2 conductor (red = 9v+ black or white ground-).
- 1 crossover cable** - a 4 conductor cable, 33" length.
- 1 zip-loc bag of installation materials:** solder, 28ga wire, shrink-wrap, tie-wraps, 2 fabric pads (black/ white oval), 4 pieces of poly foam insulation (4 dark gray crescent shaped pieces).

## Tools Needed

1. Fine tip soldering tool (20 watt or less)
2. Power drill and 5/16" bit
3. Small wire cutters
4. Small screwdriver set
5. Damp sponge - to clean solder tip
6. Butane lighter - to heat shrink wrap
7. Continuity Tester (optional) - very helpful to confirm & identify wire leads



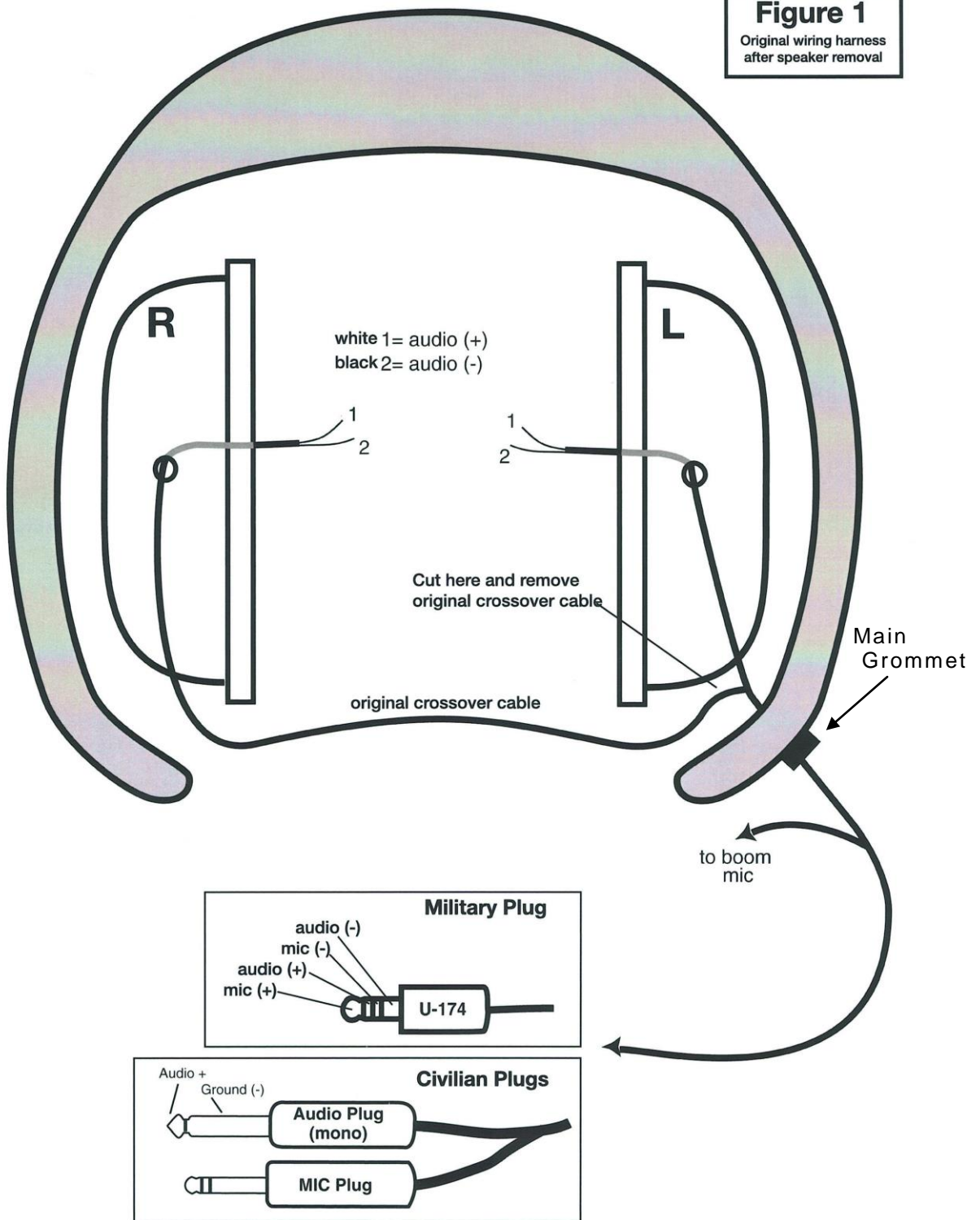
## **Installation Overview**

1. Earcups with earseals are required for installation into aviation helmets. Included with this kit is one pair of silicone gel type earseals that will fit most helmet earcups. Earcups are available for purchase if your helmet is not already so equipped.
2. The ear cups are held in place with Velcro. Remove the ear cups from the helmet, paying attention to the position of the cups and the presence of spacers between the cup and helmet shell. During re-assembly, position the ear cups as close as possible to their original location.

### **I. Remove original audio speakers**

3. Remove the ear seal from each earcup and set aside. Reach into each earcup and pull out the foam insulation and audio speaker. Disconnect both wires from each speaker.
4. Confirm the identity of these two wires on each side. In most Gentex helmets audio (+) is white and audio (-) is black. Using a continuity tester, refer to Figure 1 and confirm the color coding for (+) and (-).

**Figure 1**  
Original wiring harness  
after speaker removal



## **II. Remove original crossover cable**

Cut the original crossover cable at the place shown in Figure 1.

Remove the original crossover cable from the right earcup and set aside.

Withdraw the main audio cable from the left earcup, and partially withdraw this cable from the main grommet.

Enlarge the hole in the left earcup to 5/16 inch diameter.

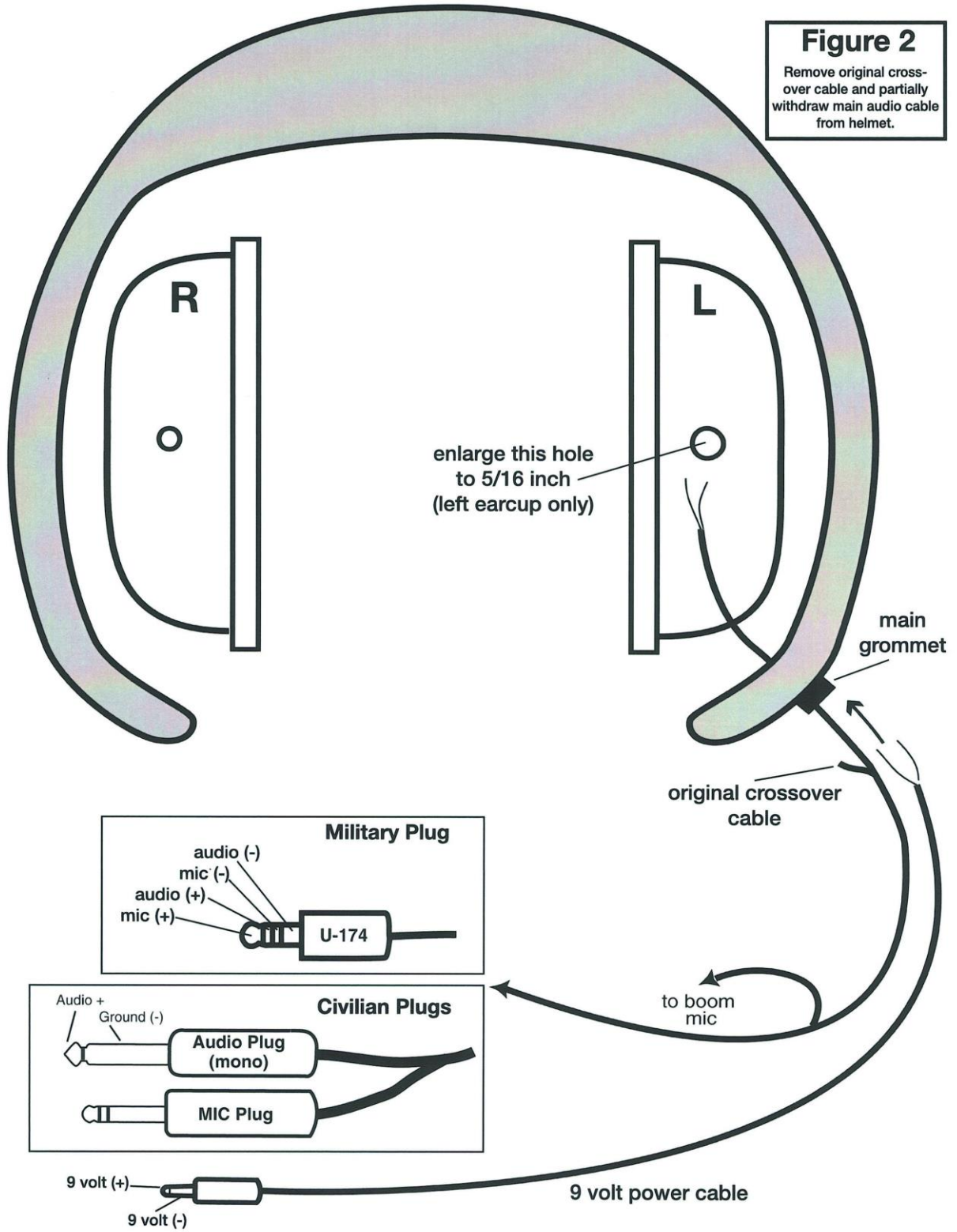
Insert the 9v power cable (together with the main audio cable) through the main grommet and into the left earcup as shown in Figure 2.

Insert the new crossover cable into the left earcup as shown in Figure 3.  
Insert the other end of the crossover cable into the right earcup.

The installation should now look like Figure 3.

**Figure 2**

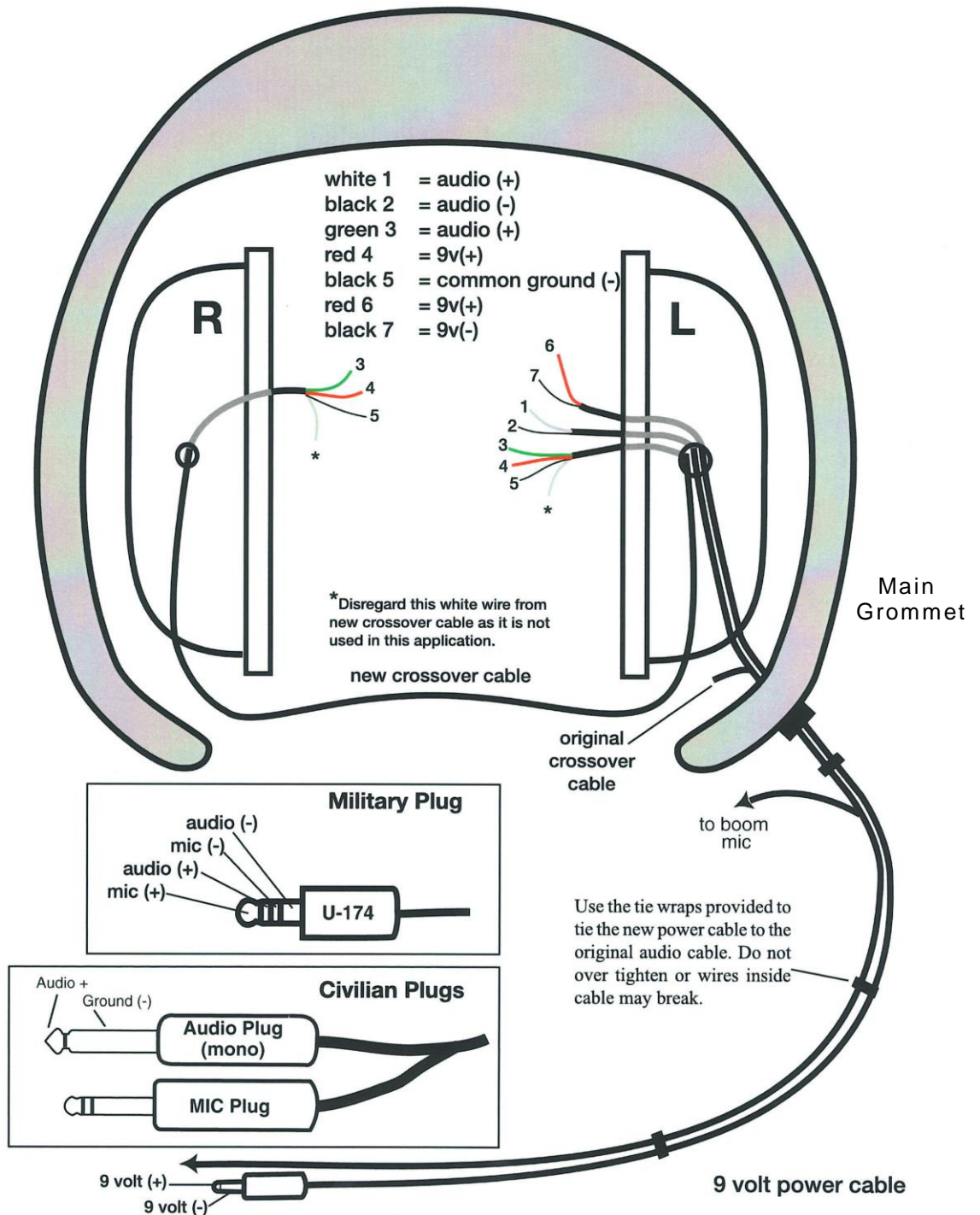
Remove original crossover cable and partially withdraw main audio cable from helmet.



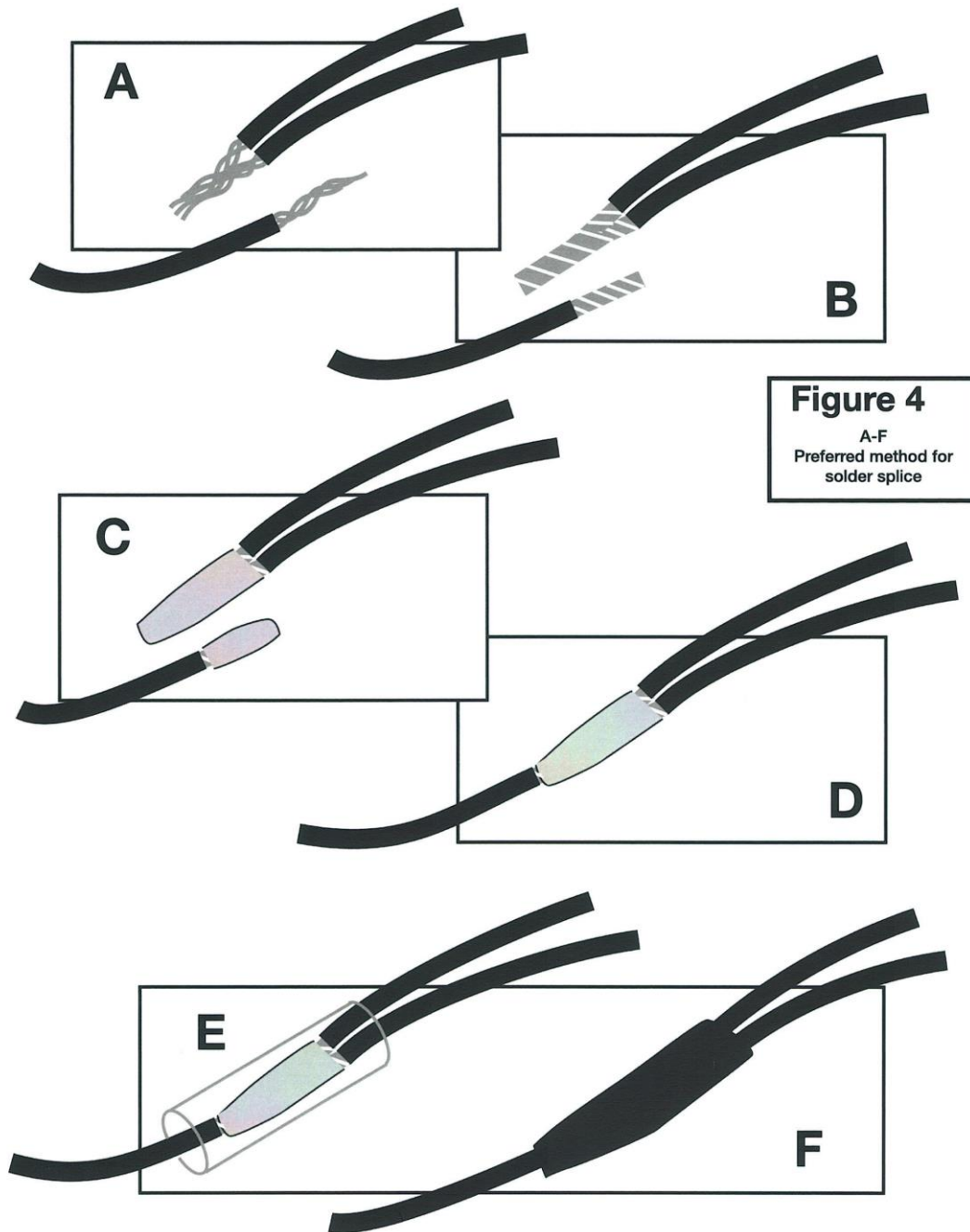
### III. Soldering the wiring harness

After installation of all cables, your headset should look like Figure 3. Review Figure 3 and Figure 5, but before soldering, study Section IV “About Soldering” and Figure 4 “Preferred method for solder splice”.

**Figure 3**  
Main wiring harness before splicing







**Figure 4**  
A-F  
Preferred method for  
solder splice

- A** Strip about 1/4 inch insulation from each wire end.
- B** Twist wire strands.
- C** Tin each wire end by melting solder into twisted wire ends.
- D** Hold wire ends together and melt into one (fuse).
- E** Slide shrink wrap over splice and heat with flame for 1-2 seconds. Heat only the shrink wrap - avoid burning insulation.
- F** Finished splice should look like this.

## **IV. About soldering**

If you are not experienced with a fine tip soldering tool, a few minutes of practice will greatly improve your proficiency. Spend enough time and care to insure that solder joints and splices are cleanly done.

Use only the 28 ga. wire provided when constructing the wiring harness and attaching to the p.c. board. Do not use heavier gage wire or the final installation will be more difficult (i.e., tucking wires & closing unit). Using the flexible 28ga. wire (and removing excess lengths of original wire) will result in a more professional installation.

Review Figure 5 for wiring sequence, but before soldering review Figure 4, "Preferred method for solder splice".

## **V. Soldering the wires**

Solder/splice wire #6 to wire #4. Attach a 3 inch piece of 28 ga. red wire. Cover with shrink wrap.

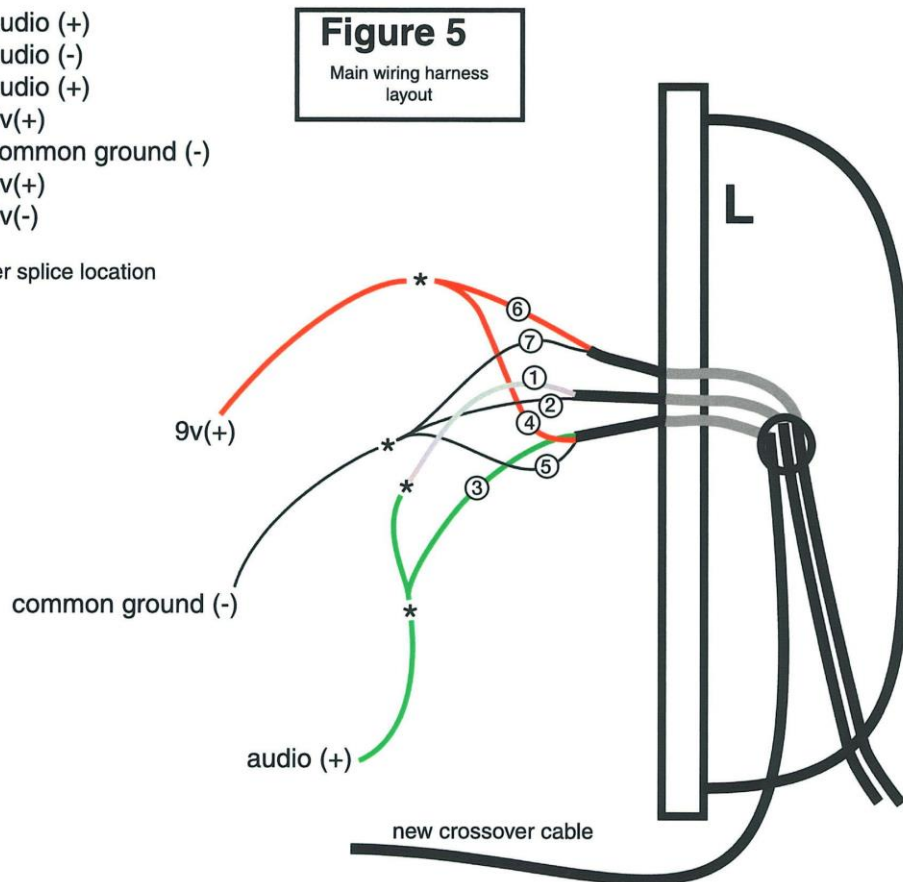
Solder/splice wire #7 to wire #2 and #5 (it may be necessary to lengthen wire #2 first, by using short length of black 28 ga. wire). Attach a 3 inch piece of 28 ga. black wire. Cover with shrink wrap.

Solder/splice wire #1 to wire #3 (it may be necessary to lengthen wire #1 first, by using short length of green 28 ga. wire). Attach a 3 inch piece of 28 ga. green wire. Cover with shrink wrap.

Your wiring harness should now look like Figure 5.

- white 1 = audio (+)
- black 2 = audio (-)
- green 3 = audio (+)
- red 4 = 9v(+)
- black 5 = common ground (-)
- red 6 = 9v(+)
- black 7 = 9v(-)

\* Typical solder splice location



## VI. Solder wires to modules

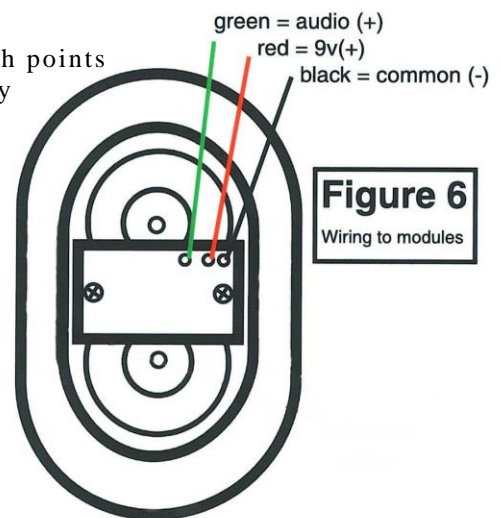
### Insert modules into earmuffs

### Install new silicone gel earseals

Melt a small spot of solder onto each of the three attach points located on the corner of each module's circuit board. Carefully solder the three wires to each circuit board according to figure 6.

Tuck the cables away and insert the gray poly foam insulation in the earmuffs. Install the modules into place in each ear cup. Insert one black/white oval fabric pad into each module. These pads are **very important**. They function to acoustically dampen the modules and **must** remain in place. If the pads become lost or soiled, call for a free set of replacements.

Install the gel earseals by carefully stretching them around the flange of the ear cups. If it is necessary to remove a module after final installation, take care not to damage module during removal. Carefully pry module from earmuff.



## **V11. Operating instructions**

**1. The silicone gel earseals provided with this product are required for proper operation of this unit.**

2. A standard aircraft radio is all that is required to power the audio portion of the anr modules. However, an audio signal is not necessary for the active noise reduction circuit to operate. Supplying 9v to the modules will activate the noise cancelling system. If audio reception or transmission is *"scratchy"*, check for tarnished brass tips on audio or mic plug. Polish if necessary.

3. In cold conditions (below 32° f ) remove the helmet from the aircraft after each flight. If helmet becomes cold soaked it is more subject to moisture condensation. Although summertime cabin temperatures will not damage or degrade the unit, the battery case can warp if left in direct sunlight.

4. Operation under cold conditions (below 40 degrees f cabin temp) can result in moisture condensation inside the earcups, causing temporary malfunction. Allow unit to warm & dry before resuming use.

5. Test the active noise system on the ramp prior to each use. If there is any malfunction (squealing, humming, or oscillation), the power should be turned off and the helmet used conventionally. Minor humming or oscillation can usually be stopped by applying light pressure to the earcup.

6. Life of a high quality 9V battery should be approximately 15-20 hours. To guard against accidentally leaving power on, unplug the power cable from battery case when unit is not in use. An optional auto shut-off battery case is available which will automatically turn the power off after 4 minutes of inactivity.

7. The active noise reduction modules require a very stable power supply. Use of cheap 9v batteries or non-approved power supply systems will cause malfunctions, possibly damaging the circuitry. We recommend Dura-Cell or Energizer.

8. Do not attempt to power the anr modules directly from your aircraft electrical system without using our panel mount power unit. The voltage spikes and background static from most aircraft will soon damage the very sensitive integrated circuits in the modules. Our panel mount power unit has a .25 amp fuse, dual voltage regulators, and is isolated with a DC/DC converter.

9. A continuity tester is very helpful, and is usually required to trace a short or broken wire. They are available for under \$20.

10. **Do not insert any material** into the modules, such as the original cloth inserts or ear covers, foam rubber, etc., **except for the black and white oval fabric pieces provided.**

*IMPORTANT: 2 black/white oval pieces of fabric are provided with each set. This material is intended to keep dirt & debris out of the speaker elements and to acoustically dampen the anr modules. One should be placed inside each anr module, covering the speaker grill holes & the microphones. Use of the fabric pads is mandatory. Failure to use these may result in feedback (squealing). If the pads are lost or become soiled, call for a free set of replacements.*

**For free technical assistance call 806-358-6336  
weekdays from 9:00 A.M. to 5:00 P.M. (Central Time).**

## **Limited Warranty**

This product is warranted to be free from defects in materials or workmanship for one (1) year from the date of purchase. Within this period, ACTIVE HEADSETS, INC. will at its sole option, repair or replace any components which fails in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labor; provided, however, that the customer shall be responsible for any transportation cost. This warranty does not cover failure due to abuse, misuse, accident or unauthorized alteration or repairs. HEADSETS, INC. assumes no responsibility for special, incidental, punitive or consequential damages, or loss of use.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE, AND IN LIEU OF ALL OTHER WARRANTIES AND REMEDIES EXPRESSED OR IMPLIED, INCLUDING ANY LIABILITY ARISING UNDER WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES SPECIFIC LEGAL RIGHTS WHICH MAY VARY FROM STATE TO STATE.

To obtain warranty service, return the unit along with a brief note indicating the nature of the problem. Include your full name, address, and daytime phone number. Place the unit in a box only (no padded envelopes). The unit should be insured and sent freight prepaid to HEADSETS, INC., 2320 Lakeview Drive, Amarillo, Texas 79109

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