Attenuating Custom Communications Earpiece System

(ACCES®)

Maintenance Manual & Users Guide

October 2014

ACCES Maintenance Manual & Users Guide
October 2014

TABLE OF CONTENTS

List of Illustrations

CHAPTER 1

Introduction to Attenuating Custom Communications Earpiece System (ACCES)

1.1. The Attenuating Custom Communications Earpiece System (ACCES) was originally designed to provide quality hearing protection for aircraft crew chiefs, while still providing clear communications when exposed to high levels of noise. The project began as a collaborative effort between the Air Force Research Laboratory (AFRL) and Westone Laboratories, Inc. Westone is widely recognized as the industry leader in hearing healthcare products. Further development of ACCES led to an aircrew version and the final modular product that is used by both ground crew and aircrew. This system is intended to help lower the cost of disability for hearing loss. The Veterans Administration treatment of hearing loss has cost taxpayers more than $5.9 billion since 1977.

1.2. By integrating specialized electronics and a voice communications cable into a custom molded earpiece, the technology allows clear communications while simultaneously protecting the ear from damaging audio frequencies. ACCES provides excellent passive attenuation, reducing noise by an average of 30 dBA. It weighs less than the hard-plastic speakers mounted inside flight helmets and is cost-effective, at about $450 per set, depending upon the application. Flight evaluations show that ACCES is comfortable and provides a significantly quieter environment inside a jet while delivering clear communications to the wearer. Future improvements could include microphones for two-way communications and Active Noise Reduction for improved noise suppression.

1.3. The decision to use Custom Hearing Protection is up to the individual units. The first step is to choose what type of hearing protection the group may need. If custom hearing protection is the most appropriate choice funding must be allocated for custom hearing protection. Currently, Air Combat Command (ACC) has approved the use of cost-per-flying hour (CPFH) funding to support purchase of aircrew earpieces and the supplies needed to make the necessary custom impressions that will be used to mold the custom earpieces. All purchases can be made by anyone authorized to use the General Services Administration (GSA) Advantage website. The ACCES plugs are available on the GSA advantage website under GSA Contract # GS-07F-0039T.

NOTE
It is very important to try your ACCES earpieces on and wear them for a couple of hours a day for a few days before using them with the modular cables or in flight. This allows for your ears to become more accustomed to the fit of a custom earpiece, which will allow better comfort when used in flight.
Read and review PREFLIGHT HANDOUT prior to using ACCES. (Attachment 1)

CHAPTER 2

Responsibilities

2.1. Flight Medicine

2.1.1. Flight Medicine is the Office of Primary Responsibility (OPR) for oversight of Standard Ear Impression Technique (SEIT) procedures for the ACCES program. Flight Medicine will take initial SEIT impressions and ship them to Westone for development. All logistic support to include reordering, routine maintenance and associated costs for training and materials remain the responsibility of the requesting flying squadron, group, or wing. The Office of Flight Medicine will be the main supply point for all ear impression supplies, and Aircrew Flight Equipment (AFE) will retain responsibility for ordering and funding those supplies.

2.1.2. The program manger is responsible for overseeing and supervising SEIT procedures and may work in one of three agencies: Flight Surgeon, Audiology, or Aerospace Physiology. The program manager must undergo SEIT training in order to take impressions or supervise technicians taking SEIT impressions. When pilots receive their first set of impressions, the program manager will ensure pilots are properly fitted and trained on the safe operation of ACCES. Routine fitting, inspection, and maintenance remain the responsibility of Aircrew Flight Equipment.

2.2. Westone Inc.

2.2.1. Westone Inc. is responsible for filling orders as requested by the Physiological Office or AFE. Westone is available to answer questions about ordering, ear impressions, etc., and is obligated to fix broken or damaged items during the first 90 days of purchase (see Attachment 2).

2.3. Pilot / Aircrew (Wearer)

2.3.1. The wearer is responsible for maintaining his/her ACCES assembly properly in accordance with paragraph 6.2 of this publication. The wearer is also responsible for notifying AFE when an item is damaged or breaks, or when new plugs need to be ordered.

2.4. Aircrew Flight Equipment (AFE)

2.4.1. AFE is responsible for the overall upkeep of the ACCES program. AFE will be the point of contact for the pilots/aircrew it maintains.
2.4.2. Inspections. AFE will perform periodic inspections on the ACCES assembly in accordance with paragraph 6.2.3., and postflight inspections in accordance with paragraph 6.2.2. of this instruction.

2.4.3. Modifications. Sanding and grinding of earpieces will be accomplished by Aircrew Flight Equipment personnel in accordance with section 5.4.1.11 and Reference (Attachment 2) of this manual.

CHAPTER 3

Selection of Custom Hearing Protection

3.1. Custom Hearing Protection with Speakers

3.1.1. ACCES AIRCREW MODULAR EARPIECE, Mfr P/N: AXAMK

3.1.1.1. Custom earpiece used in conjunction with the Aircrew Modular Cable (Fig 3-1). A key component is the vent that allows pressure equalization when changing altitudes. Ensure no names are on the earpieces, and the plugs must be gray.

Figure 3-1, ACCES MODULAR EARPIECE

CAUTION
P/N: AXGMK and AXHPK will not be used for pressurized flight operations. Using this P/N in flight may cause injury to personnel.

3.1.2. ACCES GROUNDCREW MODULAR EARPIECE, Mfr P/N: AXGMK

3.1.2.1. Custom earpiece used in conjunction with the Aircrew Modular Cable (Similar to Fig 3-1). Earpieces are not vented to provide optimal hearing protection for ground crew applications requiring communication ability.

3.2. Accessories for Custom Hearing Protection with Speakers

3.2.1. ACCES O2 COMM CABLE, Mfr P/N: 79830

3.2.1.1. Connects Aircrew ACCES to aircraft communication (Fig. 3-2). Used in place of the standard communication cable on the mask.

Figure 3-2, Oxygen Mask Communication Cord

3.2.2. ACCES AIRCREW MODULAR CABLE, Mfr P/N: Gen 6 - 79701, 79701.02 and 79701.03; Gen 7 - 79801, 79802, and 79803

3.2.2.1. (Fig. 3-3) Connects the modular earpieces to the communication cable on the oxygen mask (Fig. 3-2) to complete ACCES as a communication system. With the release of Gen 7 cables, the part numbers have changed. Part number 79701 is changed to 79801, 79701.02 is changed to 79802 and 79701.03 is changed to 79803. The Gen 7 cable has a redesigned speaker housing with integrated strain relief that is 33% slimmer than the Gen 6 cable to aid in fitting the ACCES in the earcups with the elements left in. Gen 7 also has added strain relief at the Nexus end for added strength. Part 79802 is the preferred cable for F-15 and F-16 aircraft. This cable is built with an additional 6 dB of attenuation as compared to the 79801 cable to prevent the fixed-level audible warning system from being excessively loud. Part 79803 is the preferred cable for A-10 and T-38C aircraft and has an additional 8 dB of attenuation as compared to the 79802 cable also to prevent the audible warning system from being excessively loud. Part 79801 is the preferred cable for all other approved fixed-wing airframes. Each Gen 6 cable is color coded at the nexus end of the cable and each Gen 7 cable is color coded just above the coiled portion of the cable to designate cable type. The 79701.02/79802 has an orange band printed with '79701.02 Gen 6' or '79802 Gen 7' (Fig. 3-3a), the 79701.03/79803 has a gray band printed with '79701.03 Gen 6' or '79803 Gen 7' (Fig. 3-3b), while the 79701/79801 has a blue band with '79701 Gen 6' or "79801 Gen 7' printed on it (Fig. 3-3c). Aircrew should start with the recommended cable for their aircraft type. If the audible warning system alerts are too loud, aircrew can try switching to a cable with more attenuation to decrease the volume of the audible alerts to a more tolerable level.

Figure 3-3a – (P/N 79802)
F-15, F-16, B2 and C-17 Series

Figure 3-3b – (PN 79803)
A-10 and T-38C Aircraft

Figure 3-3 – *ACCES MODULAR CABLE*

Figure 3-3c – (P/N 79801)
All other approved airframes

3.2.3. ACCES MODULAR 'L' SMB CABLE, Mfr P/N: 79812

3.2.3.1. (Fig. 3-4) Connects modular earpiece to the helmet-mounted receptacle to complete ACCES as a communication system. Part 79812 is the preferred cable for all helicopter models. The cable is color coded at the connector end of the cable with a green band with 79812 printed on it.

Figure 3-4 – (P/N 79812)
HH-60

3.2.5. DELUXE ACCES CASE (OPTIONAL), Mfr P/N: 79210

3.2.5.1. Black case used to store and protect ACCES Earpieces and Modular Cable, includes basic cleaning supplies used for proper care and use of ACCES plugs (Fig 3-5).

Figure 3-5, DELUXE ACCES CASE

3.3. Custom Hearing Protection without Speakers

3.3.1 SOLID CUSTOM ACCES, full thickness, Mfr P/N: AXHPK

3.3.1.1. Custom earpiece used in high noise environments to protect the user from harmful noise (Fig. 3-6). This is a multiple use plug offering repeatable protection and can be inserted / removed in minimal time. Ideal for high noise environments. Includes pop cord tether.

Figure 3-6, ACCES SOLID EARPIECES

NOTE
Custom molds for all earpieces are procured through Contract # GS-07F-0039T
Send an electronic copy of Westone ACCES order form to Westone for all orders for ACCES components. A completed hard copy of the order form should be included with all ear impression shipments to expedite the order process.
Request electronic fillable forms from Westone at gsa@westone.com or download from their website: www.westone.com

See **ATTACHMENT 4: ACCES ORDER INSTRUCTIONS** for further direction on ordering.

CHAPTER 4

Custom Hearing Protection Usage

4.1. When the Custom Hearing Protection is received from Westone, contact your Custom Hearing Protection Program Manager (CHPPM) to arrange for a briefing with the new Custom Hearing Protection User. This allows the user to learn exactly how to insert the plugs and for the CHPPM to assist with any minor fit issue that may arise during the initial wearing of the plug.

4.2. Below are important items that the user must understand about inserting and removing Custom Hearing Protection. Right and left earpieces are identified by laser engraving. Red ink for right side, blue ink for left side, or with –R or –L at the end of the serial number to identify the proper side.

4.2.1. Insertion Instructions
          a. Assemble earpiece and modular cable by placing the speaker portion of the cable into the earpieces. Ensure that BOTH flanges of the speaker fits completely into the earpiece to ensure proper seal and prevent slit leak and/or discomfort. See Preflight Handout (Attachment 1) for further instruction.

          b. Place the canal portion of the earpiece into your ear canal (Fig. 4-1.1) and slightly rotate towards the front of your head. It may be helpful to pull up on the top of your ear with the opposite hand when inserting your custom fit ear products.

          c. While pressing inward on the canal portion of the earpiece, rotate the earpiece toward the rear of the head and the earpiece should "snap" snugly into place (Fig. 4-1.2).

          d. Ensure the earpiece sits flush in the ear (Fig. 4-1.3).

| *Figure 4-1.1* | *Figure 4-1.2* | *Figure 4-1.3* |

Figure 4-1, EARPIECE INSERTION

4.2.2. Removal Instructions

          a. To remove, pull up on the top of the ear slightly to break the seal.

          b. Grasp the earpiece and rotate it forward as you pull it gently from the ear.

CHAPTER 5

Aircrew ACCES Instructions
(HGU-55/P or HGU-55A/P Helmet with MBU-12/P Mask or MBU-20/P Mask)

5.1. Materials Required, Description, Reference Number
  - HGU-55/P, HGU-55A/P, or HGU-55/P Lightweight helmet
  - MBU-12/P Mask or MBU-20/P Mask
  - ACCES modular cable, Mfr P/N 79801, 79802, or 79803 (Fig. 3-3)
  - ACCES custom earpieces, Mfr P/N AXAMK (Fig. 3-1)
  - ACCES mask communication cord Mfr P/N 79830 (Fig. 3-2)

5.2. Support Equipment Required
  - Blue Stone Bit, P/N 41201 (Westone Laboratories, Inc)

5.3. INSTALLATION STEPS

5.3.1. Adapting the helmet to accommodate ACCES.

5.3.1.1. Remove the mask from the helmet.

5.3.1.2. Remove the ear cups and any padded spacers from the helmet.

5.3.1.3. Ensure the speakers and attenuating foam remains in the ear cup.

WARNING
ACCES is not compatible with AERP equipment. Any attempt to force compatibility
will lead to damage to equipment and reduced protection of aircrew.

5.4.1.4. Replace ear cups and spacers to properly fit wearer.

5.4.1.5. Ensure the ear cups have been fit IAW 14P3-4-151

5.4.1.6. Remove existing mask communication cord and replace with Mfr P/N 79706
(Fig. 3-2).

5.4.1.7. Base of communication split for microphone cable and headset plug-in should be
towards inside of wearer's body for easier connection while wearing helmet and mask.

5.4.1.8. Perform continuity check using a SCOT, MQ-1 series, equivalent AF approved
test set.

5.4.1.9. Store the earpiece units and headset cable in zip lock bag when not in use to
protect against moisture and dust. Hard case is optional (Fig. 3-4).

5.4.1.10. If wearer experiences discomfort due to pressure on the ACCES assembly, the ear cup may not be fit properly. Reposition the ear cups to ensure ACCES is in the center of the ear cup.

5.4.1.11. If hotspots occur proceed as follows.

5.4.1.11.1. Identify the area that requires modification. If unable to locate, have the crewmember wear the plugs for at least an hour, then see Physiology flight so they can look for hot spots in the ear.

NOTE
If the crewmember complains of discomfort after one
flight, or after a short period of time, ensure they continue
wearing the plugs. They may take some time to get used
to. However, if the plugs are causing serious discomfort,
consider modification, or obtaining a new ear plug.

NOTE
If hotspots are noted in multiple areas have the
crewmember's ear impression taken again.

5.4.1.11.2. Slowly grind away affected material with a high-speed rotary tool and the blue stone bit.

5.4.1.11.3. Have the crewmember try the modified plug for one hour.

5.4.1.11.4. Repeat process until a comfortable fit is obtained.

NOTE
If the crewmember has an irritated region of the ear, a
modified earpiece may not feel right until that irritated
section has had a time to heal.

CHAPTER 6

Aircrew ACCES Fitting and Operating Procedures

6.1. ACCES Fitting Procedures
NOTE
Do not remove ACCES plugs by pulling on the ACCES modular cable. Remove plugs by gripping plug and rotating forward until plug removes itself from ear canal. However, pulling on the cable to dismount the ACCES from the ear canal can be briefed as an Emergency Procedure if an in-flight rapid descent cannot be aborted and the vent is not equalizing.

NOTE
To ensure optimal fit and comfort, refer to Preflight Handout (Attachment 1) for further instruction on how the Modular Earpieces and Modular Cables are assembled. Ensure that BOTH flanges of the speaker housing fits completely into the earpiece in order to achieve the proper seal preventing slit leak and/or discomfort.

6.1.1. Wearer inserts ACCES plugs by following the insertion instructions in 4.2.1.

6.1.2. Use ACCES plugs as passive protection once leaving the AFE facility on the way to the aircraft to reduce exposure to noise.

6.1.3. Don helmet and mask assembly using normal procedures.

6.1.4. Connect ACCES speaker cable (Mfr P/N: 79801, 79802, or 79803) to communications connector at the top of the oxygen hose (Mfr P/N: 79830).

6.1.5. Wires leading from the ears to the 79830 Connector junction go in front of the wearer's throat.

CAUTION
Ensure all cables are worn outside helmet chin strap.

6.2. ACCES Care and Use Procedures

CAUTION
Ensure the pressure vent and sound bore are clear. This action is critical to ensure communication audio intelligibility and adequate pressure equalization across the earpieces during flight. Improper equalization could result in ear trauma**.**

CAUTION
If ears become obstructed during flight, attempt to break the seal. Then, swap out earpieces with the spare set (if carried). You may not be able to switch back to the "yellow foamies," if your helmet is not wired for dual compatibility. DO NOT

VALSALVA during an obstruction. This will further increase the negative pressure resulting in serious injury.

6.2.1. Pre-Flight Inspection

6.2.1.1. Aircrew/Pilot accomplishes communications test with donned ACCES, helmet and mask using a SCOT, MQ-1 series, equivalent AF approved test set. Ensure communication signal is clear and equal to each ear. Inspect earpieces for earwax and foreign debris.

6.2.1.2. Ensure earpiece sound bore and pressure equalization vents are clear.

6.2.1.3. Ensure external condition of ACCES plug is free of dirt, debris, cracks, and deterioration.

6.2.2. Post-Flight Inspection

6.2.2.1. (Aircrew) Remove custom earpieces from modular cable assembly. Grasp at connection (not the cable).

6.2.2.2. (Aircrew) Inspect earpieces for earwax and foreign debris. Clean plug surface of ear canal area with soap and water as necessary. DO NOT use an alcohol based substance; dry completely.

6.2.2.3. (Aircrew) Use a bulb blower or canned air to ensure earpiece sound bore and pressure equalization vents are clear (Fig. 6-1). Use finger to feel for air flowing out opposite end of earpiece.

Figure 6-1, CLEARING EARPIECE SOUND BORE

6.2.2.4. (Aircrew) Reattach ACCES custom earpieces to modular speaker cable.

6.2.2.5. (Aircrew) Place in a zip lock bag for storage.

6.2.3. Periodic Inspection

NOTE
Periodic inspections will be accomplished by AFE
personnel concurrent with the helmet and oxygen mask
inspection cycle.

6.2.3.1. Ensure the ACCES modular cable is free of cracks, holes, dust, and other damage or wear that may affect the proper use of the equipment. Replace if found defective.

6.2.3.2. Ensure the ACCES custom earpieces are free of dirt, debris, holes (other than design features), cracks, and deterioration. Replace (or order) defective items.

6.2.3.3. Ensure the ACCES oxygen mask communication cord assembly is free of corrosion, cracks, cuts, and frayed wires. Replace if found defective.

6.2.3.4. Test ACCES modular cable with the Universal Audio Cable Verification (UACV) test set IAW procedures in Attachment 6.

6.2.3.5 Test entire communication system with SCOT, MQ-1 series, equivalent AF approved test set.. Ensure speaker and microphone are within range.

6.2.4. External Ear Blocks

6.2.4.1. The ACCES earpiece is designed to fit deep within the ear canal. This enables the earphone to deliver both superior communication and hearing protection. A vent as small as .02 inches in diameter provides adequate ventilation without compromising the noise protection afforded by the system.

6.2.4.2. It is essential that the vents in the earphones remain open at all times. Earwax, pocket FOD, and debris within the helmet ear cups can all form an obstruction within the vent which can lead to a major injury or mishap. If the vent is obstructed on ascent, it will go unnoticed. However, on descent, as ambient pressure INCREASES, the volume of trapped air in the ear further DECREASES, creating negative pressure within the external ear canal.   The negative pressure pulls the earpiece inward creating a tight seal with the walls of the ear canal leading to one or more of the following: extreme pain, loss of communication, (temporary or permanent) loss of hearing on the affected side, ruptured eardrum, and uncontrollable dizziness. Valsalva is required on descent ONLY if earpieces are working normally.

6.2.4.3. Always treat the earpieces with care and respect by keeping them clean, storing them properly, performing preflight and postflight inspections (paragraphs 6.2.1. and 6.2.2.), and ensuring the Flight Surgeon checks aircrew's ears for wax buildup frequently.

Attachment 1: Pre-flight Procedures/Handout

PLEASE READ THOROUGHLY BEFORE USING ACCES®

ACCES PRIOR-TO-FLIGHT PRECAUTIONS

ACCES is designed to provide high quality listening communications along with maximum hearing protection in very loud noise environments. As such, custom ACCES earpieces are intentionally manufactured to fit snug and deep. These earpieces can fit and feel much different than other hearing protection products you may have worn. With most individuals, an adjustment or "break in" period is necessary. By following these step-by-step procedures, you should be able to comfortably enjoy the many benefits of ACCES.

INITIAL INSERTION

ACCES custom earpieces are made of high durability OtoBlast™ silicone. We recommend test fitting the earpieces alone (without cables) the first time. Since OtoBlast is a fairly tacky material, using a small amount of Oto-Ease™ (provided) should facilitate insertion. The laser engraving is dyed to identify which ear the earpiece will fit, right (red) vs. left (blue). With each earpiece slightly rotated forward, place the canal portion into each ear canal. Fully seat the earpiece by rotating it back and in. Each earpiece should fill your entire outer ear and feel secure or "locked-in". A feeling of ear "fullness" is expected and a slight amount of initial discomfort is fairly common. Wearing the earpieces for up to several hours, for a few days allows the ears to get used to the feel of custom earpieces and should eliminate most comfort issues. Greater amounts of discomfort would indicate the need for the earpiece to be modified or remade.

CABLE INSERTION

With the earpiece removed from your ear, refer to the photos below to properly connect the modular cables. The receiver modules "friction fit" tight and snug into the ACCES earpieces via the corresponding openings. Simply press each into place, making sure that both flanges are inserted completely into each earpiece. Again, it is suggested to now "test fit" the ACCES earpieces with cables attached, to verify insertion and comfort. Please ensure that the cables are fully inserted into the earpieces for maximum comfort and performance.

CORRECT

Correct. Cable fully inserted and fully seated in earpiece.

INCORRECT

Incorrect. Cable not fully inserted and seated.

INCORRECT

Incorrect. Cable only partially inserted and seated.

PLEASE READ THOROUGHLY BEFORE USING ACCES®

NOTE:
A very small percentage of individuals may have an allergic reaction to the silicone and/or the color pigments used in the manufacturing of ACCES. If this should occur, **you should discontinue wearing the product.**

REMOVING ACCES EARPIECES
Gently pull up on the outer ear to break the earpiece seal. Using your thumb and forefinger, grasp the earpiece and rotate it slightly forward while pulling each earpiece out and away from your ear.

HELMET USE
Once fit has been verified with the cables and the ACCES earpieces are seated in each ear, verify a comfortable fit under your helmet or headset. If your helmet ear cups need to be repositioned or modified, see the current Air Force Technical Order for more information.

TESTING THE ELECTRONICS
Before flying for the first time with ACCES, it is imperative to test ACCES with the aircraft communication system. Attach all cables as indicated and verify connection and sound quality.

ACCES MAINTANENCE
Routinely wipe each earpiece off with the provided cloth and inspect each earpiece for cerumen (wax) or other debris. Remove any debris from the sound bore using the provided wax loop. Then use a bulb blower or canned compressed air to ensure sound bores and vents are free of obstruction. If more thorough cleaning is needed, REMOVE the modular cables from each ACCES earpiece by grasping at each receiver module-NOT THE CABLE. Clean the earpieces in warm soapy water. Do not use any harsh cleaners or alcohol based substances. Allow earpieces to dry completely and again use a bulb blower or canned compressed air to ensure bores and vents are free of obstruction. Finally, place the ACCES unit in the provided zip lock static free bag or Deluxe ACCES Case for storage until next use.

EAR HEALTH
Using any type of earplug on a regular basis can cause a build up of cerumen in your ears. In order to ensure the best fit for your ACCES earpieces and healthy ears, it is recommended that you clean your ears on a regular basis by allowing warm water to run into your ears while showering. The water will help flush out any natural wax buildup. Over the counter ear cleaning kits can also be used. Severely impacted wax should be removed with assistance from medical personnel, followed by a regular schedule of cleaning your ears to minimize future wax buildup.

Attachment 2: Warranty Information

ACCES® Warranty and Liability Information

Westone ACCES products are warranted for a period of ninety days for fit, comfort, and cables and one year for manufacturing defects. During the warranty period, Westone will replace or repair the products free of charge. GSA Schedule repair rates apply for out of warranty repairs. All warranty terms are per GSA Schedule Contract #GS-35F-0867R.

Westone makes no additional warranties of any kind with regards to the products under this agreement. Any such warranties are hereby expressly disclaimed to the maximum extent permitted by law, including all warranties, express or implied, of merchantability, fitness for use, and/or fitness for a particular purpose.

Westone shall not be liable for consequential damages resulting from any defect or deficiencies in items accepted under this agreement.

To initiate a warranty claim, please contact Westone to obtain a Return Authorization Number. Send your securely packaged product along with your ship-to address, phone number, email address and the Return Authorization Number.

ⓈWestone®
2235 Executive Circle
Colorado Springs, CO 80906
(719) 540-9333
gsa@westone.com

Licensed from the United States of America under
U.S. Patent Application Serial No. 11/417,281.

Form 72-03-04 RevA
PN 98922 12/06

Attachment 3: Earpiece Modification Instruction

Modifying Earpieces for Comfort

While it is Westone's intent to provide the best fitting earpiece possible, physically and acoustically, occasionally there may be a need to modify an ACCES earpiece. Minor changes in the fit of an earpiece can greatly affect the end user's satisfaction level. The ability to quickly remedy minor complaints in the field can ensure continued and proper use of the custom fit hearing protection products.

Note: Modifying an earpiece in the field is designed to relieve minor irritation which may be caused by a "high spot" on the otherwise properly fitting ACCES earpiece. If an ACCES earpiece is an overall poor fit, it should be remade.

We recommend the use of a bench grinder or hand held grinder to modify the Silicone earmolds you will be fitting. This type of grinder is different from the "Dremel type" hand grinders sold for use by home hobbyists. The grinders we recommend are equipped with controls, allowing for both speed and direction of rotation adjustments.

The grinding stone we recommend for use with silicone earpieces is the Coarse Blue grinding stone. This stone is very porous, and combined with its large size, is able to quickly and easily remove silicone material.

Basic Grinding 101:
Before modification of an earpiece, it is necessary to balance or "true" the grinding stone in the collet of the hand tool, or chuck of the bench grinder. To do so, insert the grinding stone into the collet or chuck and spin it at approximately half speed. Lightly touch a finger to the grinding stone. You are trying to detect any vibration in the rotation of the stone. The smoother the rotation, the smoother the surface of the earmold will be after grinding. If there is significant vibration in the rotation of the grinding stone, turn off the motor and rotate the stone in the collet approximately 20 degrees in a counterclockwise direction. Restart the motor and see if the vibration has improved. If not, repeat the procedure. The grinding stone should run more smoothly in one position than any other. This is referred to as "balanced" or "true".

Modifying an earpiece:
Ask your patient if they can direct you to the area of the earpiece that seems to be bothering them. With the ACCES earpiece out of the ear, show the patient how the earpiece sits in the ear. Ask if the discomfort comes from the canal portion or a more external portion of the earpiece.

Earpiece Modification Instruction – Continued

Next, use your otoscope to inspect the ear. You may be able to notice red marks in the ear canal or outer ear that would indicate pressure spots caused by the earpiece. Once you have determined the possible pressure source, inspect the earpiece to see if any ridges or bumps may correspond with the irritated area(s) in the ear. These are the areas on the earpiece to smooth down. The Blue stone works most efficiently with your grinder set to full-on, (the highest speed).
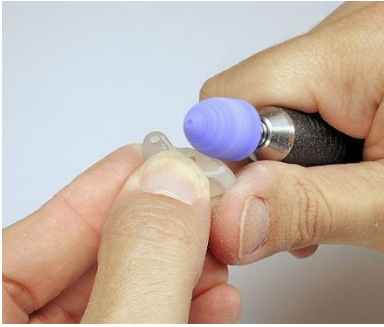
 When removing material from an earpiece, it is important to work against the rotation of the grinding stone. If the grinder motor turns counter clockwise (as most do), move the earpiece from right to left against the stone. If you are using a hand held grinder, hold the earpiece in the left hand and "pull" the grinding stone (the grinding tool is held in your right hand) towards yourself in short smooth motions. This will leave a cleaner finish on the earpiece.

Do not refit the earpiece immediately. Allow the ear a day or two to heal. This will allow the user to determine if a positive change has been made in the earpiece fit.

Caring for your Communication Earpieces*
- Disconnect all electronic components from modular earpieces.
- Wipe earpiece with a damp cloth using disinfectant cleaner or warm soapy water.
- Use compressed air or an earmold Air Blower (bulb) to ensure the pressure relief vents (where applicable) are free of obstruction.
- Reconnect communication device.

Attachment 4:

<u>**WESTONE ACCES ORDERING INSTRUCTIONS**</u>

Here are the steps for the most efficient ordering process for our ACCES products:

FOR ANY ORDERS WHICH INCLUDE EARPIECES:

1. Have the impressions made per Flight Medicine Instructions:
   To ensure the best custom fit -
   - Be sure to get the proper canal depth (past the second bend)
   - Make sure all the retentive features are filled (helix, concha, tragus, anti-tragus)
   - Make sure there are no voids
   - Make sure that there is an adequate amount of material on the outside of the ear

   Place pairs of impressions in individual zip lock baggies. Include completed Impression ID Card (found in electronic order form) for each set of impressions.

2. Fill out the Electronic Westone Order Form (contact gsa@westone.com to request) –
   - Save an electronic copy for your records.

NOTE: After filling in your contact information you can save the file electronically and use again for future orders. This will save you from repeating information. However, be sure to save a copy of each order you place for your records.
   - Send completed electronic copy of order form to gsa@westone.com for each batch of impressions or 'order' you are sending in.
   - Print a copy to include with the impression shipment to Westone.

NOTE: Be sure to identify each pair of impressions using the Impression ID cards included in the electronic file of the order form.

3. Ship impressions along with a paper copy of Order Form to Westone –
   Westone Laboratories, Inc
   ATTN: Military Products
   2235 Executive Circle
   Colorado Springs, CO 80906
   (719) 540-9333

NOTE: If sending multiple impressions for the same order, please include all impressions in the same box. Individual Westone mailing boxes should only be used if you are only sending in one pair for a single order. If using the Individual Westone Mailer Box – Please mark MILITARY PRODUCTS clearly on the outside of the box to help direct it to the proper department for processing. Mailing the individual boxes via USPS may delay your order by a couple weeks.

NOTE: Westone keeps military ear impressions on file for two years. If ordering earpieces from impressions we already have in house:

- Complete the Westone Order form and send an electronic copy to gsa@westone.com -Notate on the order form that impressions are already in house.

4. Upon receipt of impressions at Westone, the lab will inspect the impressions for quality.

NOTE: We will contact the POC for the order to let them know which and how many impressions are good for production. Together we will determine how many impressions can begin processing or if any need to be redone.

5. To initiate production:
    - OPTION ONE:
        1. The payment POC authorizes payment directly with Westone via telephone or email. (800) 525-5071 (ask for Military Products) or gsa@westone.com.
        2. Payment is processed once the order is completed and shipped.
    - OPTION TWO:
        1. The payment POC can go to www.gsaadvantage.gov and place the order. Try keywords: Westone ACCES (for earpieces, cables, and replacement parts), or Westone Ear (more impression taking supplies and such)

NOTE: Use GSA Advantage as you would any standard online shopping site to place order. All items listed on our GSA Contract (GS-07F-0039T) are available on GSA Advantage. Most people order 2 pairs of earpieces along with 2 modular cables as the initial order. This allows quick and easy replacement (since they have it on hand) if one ear or pair gets lost or damaged.

2. Once the order is placed on the GSA Advantage website, we will receive it, match it with the impressions, and submit it to the lab for processing.
3. Payment is processed once the order is completed and shipped.

IMPORTANT: Don't place an order for earpieces on GSA Advantage until we receive impressions and verify quality. When you place an order for earpieces, be sure to only place the order for the good impressions. Example - if you have 10 impressions but only 8 are good and 2 are bad, then only order 8 pairs (unless you want 2 pairs per person then

it would be 16...) Once we receive the 2 replacement impressions for the bad ones, we will contact you and let you know that you can place the order for those other two.

6. We will ship the finished earpieces as soon as the order is complete. Standard turn around is two to three weeks.

As previously mentioned... if there are any bad impressions, we will have you send us new ones. We will treat those as their own order and follow the aforementioned steps.

FOR ANY 'SUPPLY ONLY' ORDERS (WHICH DO NOT INCLUDE EARPIECES):

The most efficient way to order cables and or impression materials is through GSA Advantage. https://www.gsaadvantage.gov/advgsa/advantage/main/start_page.do

1. The payment POC can go to www.gsaadvantage.gov and place the order.
   Try keywords: Westone ACCES (for cables and replacement parts), or Westone Ear (more impression taking supplies and such)

Use GSA Advantage as you would any standard online shopping site to place order.
All items listed on our GSA Contract (GS-07F-0039T) are available on GSA Advantage.

2. Once the order is placed on the GSA Advantage website, we will process and ship

3. Payment is processed upon shipment.

Orders can also be placed by calling 800-525-5071 (ask for Military Products) or email gsa@westone.com.

Attachment 5: Westone's ACCES Order Form

ACCES Earpiece Order Form

Westone®
2235 Executive Circle
Colorado Springs, CO 80906
800-525-5071

Please complete the form in its entirety. Any blank entries may delay the order. This is best viewed with Adobe Acrobat Reader 8.0 or later. If you do not have the latest version, click here for your free version.

Contact Information

Squadron/Wing: _____   Account # _____ Order # _____

Airframe: _____   Order POC: _____

Ship To: _____   Order POC Phone: _____ email: _____

_____   Impression Taker: _____

_____   Phone: _____ email: _____

_____   Card Holder POC: _____

PO#/Contract#: _____   Card Holder Phone: _____ email: _____

Earpiece Orders

| Name	Last 4	Laser Engraving	Earpiece Style	Color #1	Color #2	Cable Type	79706	79210
1.							☐	☐
2.							☐	☐
3.							☐	☐
4.							☐	☐
5.							☐	☐
6.							☐	☐
7.							☐	☐
8.							☐	☐
9.							☐	☐
10.							☐	☐
11.							☐	☐
12.							☐	☐
13.							☐	☐
14.							☐	☐
15.							☐	☐
16.							☐	☐
17.							☐	☐
18.							☐	☐
19.							☐	☐
20.							☐	☐

Special Requests:

_____

_____

_____

For Westone Use Only
Date Order Received:
Date Impressions Received:
Date Approved:
Date to Lab:
Estimated Ship Date:
Actual Ship Date:

Form 751-10-04 Rev B

[Reset Form] [Submit By Email] [Print Form]

Attachment 6: Universal Audio Cable Verification (UACV) Instruction Manual
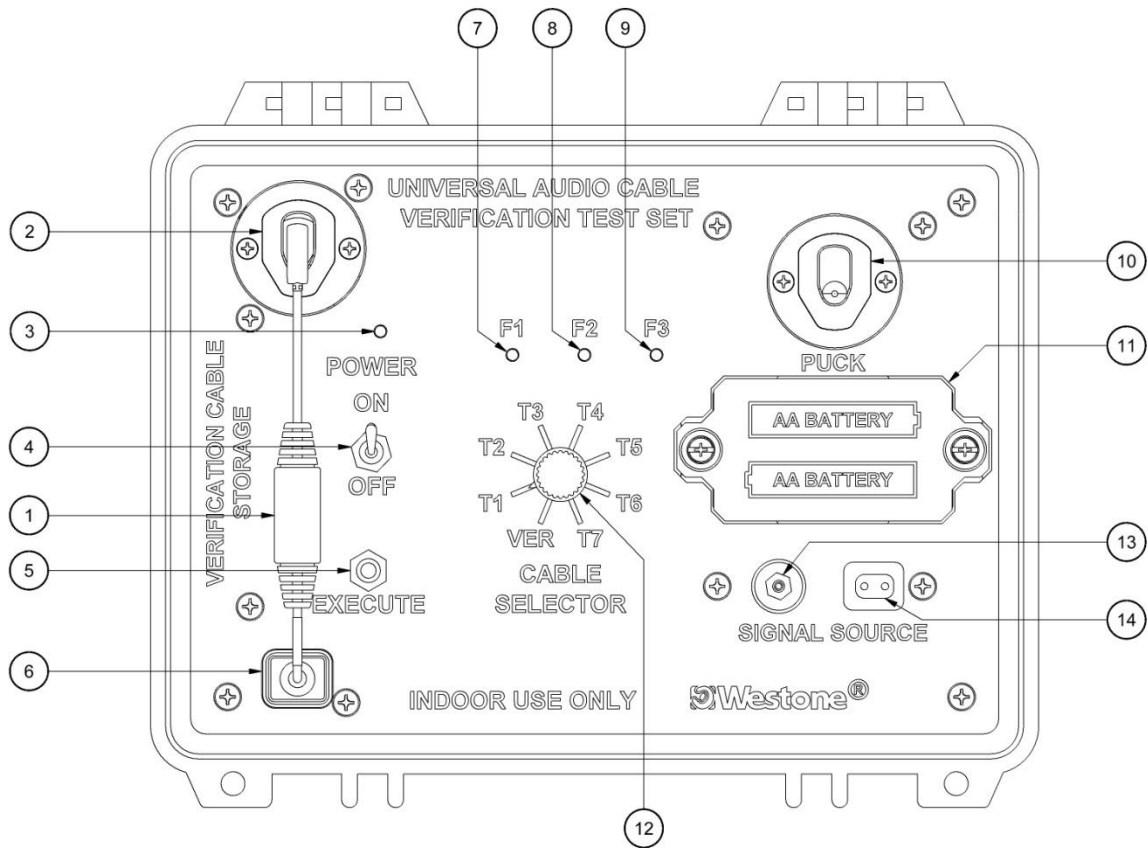
1. **Verification Cable** – Used to calibrate the test set. The cable has a serial number the same as the UACV and should only be used with the partnered UACV.
2. **Spare Puck** - Holder for the Verification cable earpiece. There is a factory maintenance connector located underneath the spare puck.
3. **POWER LED** - Power status showing the unit is operational. Also indicates a low battery condition.
4. **POWER Switch** - Enables or disables the UACV.
5. **EXECUTE Button** - Pressing this button initializes measurements in the UACV.
6. **Nexus-Type Holder** - Used to retain and store the Verification cable Nexus connector.
7. **F1 LED** - Tri-Color (Red, Yellow, Green) Light Emitting Diode (LED) associated with the 300 Hz F1 test Frequency.
8. **F2 LED** - Tri-Color LED associated with the 3500 Hz F2 test frequency.
9. **F3 LED** - Tri-Color LED associated with the 5000 Hz F3 test frequency.
10. **PUCK** - A silicon piece that the ACCES cable speaker housing is inserted into for audio measurements. A measurement microphone is mounted below the PUCK to convert the audio signals to electronic signals.
11. **Battery Compartment** - Contains two alkaline AA batteries to power the UACV. Replacement batteries will be installed per the illustration displayed on the access door.
12. **CABLE SELECTOR** - Operator uses to select the required test.

13. **SMB SIGNAL SOURCE Connector** - Signal interface for the ACCES 79812 cable type.
14. **Two-pin SIGNAL SOURCE Receptacle** - Signal interface for the 79801, 79802, or 79803 ACCES cables.

Universal Audio Cable Verification (UACV) tester Theory of Operation

Introduction

The UACV is designed to primarily test the Westone ACCES cables for a failed or degraded frequency response. It does not test for intermittence or distortion. The ACCES cables contain circuitry that condition the audio signal coming from the aircraft communications system. This conditioning circuitry makes it impossible to do a simple impedance measurement test on the ACCES cables as has traditionally been done with the ear-cup mounted speakers in the helmets. The UAVC tester performs an audio test to verify the correct audio signal and measurements on the ACCES cables at three discrete frequencies (300 Hz, 3500 Hz, and 5000 Hz). The UACV is designed to test up to six different cable types and includes a function to test for an intermittent condition.

Basic Circuitry Description

The UACV is a microprocessor-based system that facilitates complex testing in a relatively simple system. The UACV is comprised of three basic sections:

1. Stimulus
2. Audio Transducer
3. Measurement

Stimulus - An audio signal source that has controllable amplitude and frequency with good fidelity. The on-board microprocessor utilizes a Direct Digital Frequency Synthesizer (DDFS) to create the audio stimulus. The DDFS utilizes a clock signal generated in the microprocessor. The microprocessor programs the DDFS to output a high fidelity sinusoidal signal at 300 Hz, 3500 Hz and 5000 Hz. A set of coarse attenuators and a precision digital 255-step fine attenuator control the stimulus voltage amplitude. These attenuators provide more than 70 dB of amplitude control. The stimulus provides an electronic low impedance signal to the Signal Source outputs on the UACV panel.

Audio Transducer - The audio transducer is comprised of a small electronic microphone, a small acoustic cavity built into the UACV and a "puck". The puck is a silicon 'holder' that seats and seals the ACCES speaker being tested. When the speaker is correctly seated into the small retention ring in the puck, a repeatable airtight seal is formed that allows consistent audio measurements. The microphone is wired into the electronic assembly of the UACV where the electronic signal from the microphone (transducer) is applied to the measurement section.

NOTE
It is important to keep the area around the microphone and puck clear of dust and debris which could adversely affect the microphone performance.

Measurement Section - The measurement section of the system consists of an audio buffer amplifier, an audio half-wave amplitude detector and an Analog to Digital Converter (ADC), which is built into the microprocessor. The audio signal from the speaker being tested stimulates the microphone and the audio signal is converted into a simple DC signal level that is read at the detector output by the microprocessor.

Audio Measurement

An audio measurement is a made by the UACV in the following manner:
There are three memory locations for each of the seven cable types (T1 – T6). Each memory location contains the coarse and fine attenuator settings that provide a stimulus level to produce a 1.5 Volt DC output at the detector. The ADC in the microprocessor measures the DC signal level and compares that to the pass/fail criteria contained in the microprocessor firmware. The microprocessor then generates signals to display a flashing Red or steady Green LED indication for each test frequency.

NOTE
Vibrations will cause erroneous indications during the test. When performing tests, locate the UACV in an area where there are no vibrations. **The UACV is intended for indoor use only**.

Verification Cable Functions

The VER (Verification) position of the CABLE SELECTOR switch is used to perform two functions:

1. Verify that the UACV is measuring correctly; and
2. Provide a Barometric correction for changes in:
   a. Altitude
   b. Temperature
   c. Humidity
   d. Local weather changes

The UACV has a Verification Cable with the same serial number as the unit itself. The UACV has "learned" the frequency settings for the specific Verification Cable. The Verification Cable has much tighter error tolerances than regular ACCES cables. The ACCES Cable settings that are stored in memory are representative settings for that model of ACCES Cable and include normal manufacturing variations. This is not the case with the Verification Cable included with each unit.

NOTE

The Verification Cable is not interchangeable between test sets. Each Verification Cable is labeled with the serial number of the UACV it was shipped with and must remain with its mated UACV. If a Verification Cable is lost, return the UACV to the manufacturer to obtain a replacement Verification Cable.

Since the Verification Cable settings are more accurately defined for the specific unit, changes in the Verification Cable response are mostly due to changes in barometric pressure. The UACV takes advantage of this fact and measures the average offset amplitude for the three measured frequencies and stores a calculated amplitude correction factor each time the "VER" calibration test is accomplished. The UACV also stores the unit temperature each time the "VER" test is accomplished.

Running the "VER" test frequently improves the accuracy of all cable measurements. The "VER" test should be accomplished at least once a day when the UACV is used. Anytime the UACV senses a temperature change of at least 2.5 degrees Celsius, the F1/F2/F3 LED's will flash yellow briefly after depressing the EXECUTE button. This indicates that the "VER" test should be accomplished to ensure the most accurate results.

The F1/F2/F3 LED indications for the "VER" test are different than that of a normal ACCES cable. Once the EXECUTE button is pressed to start the "VER" test, the LED's sequentially turn yellow as the test is running. This "VER" measurement routine needs to measure all three frequencies and perform mathematical routines before determining if the Verification cable is passing. Pass/Fail indications for the "VER" test occur at the end of the measurement cycle.

UACV Audio Intermittent Test

Overview
The Intermittent test is added to the T7 position as an upgrade to models sold before xxxxx and is a standard feature on production models after that date to give the field operator a means of finding suspected "intermittent" cables. (These are ACCES cables that are reported to have the audio signals cut in and out at random.)

Implementation
The best way to implement an intermittent test is to provide a constant audio tone to the ACCES cable earpieces so that the field operator can wiggle and bend the cables to cause the audio to cut out. Most intermittent cable failures are caused by a mechanical connection in the cables opening up as a stress bend is placed in that area of the cable.

Theory of Operation
Figure 1 shows a simplified block diagram of the UACV electronics. The UACV is comprised of three main sections:
   1. UACV Signal Source Section
   2. UACV Measurement Detector
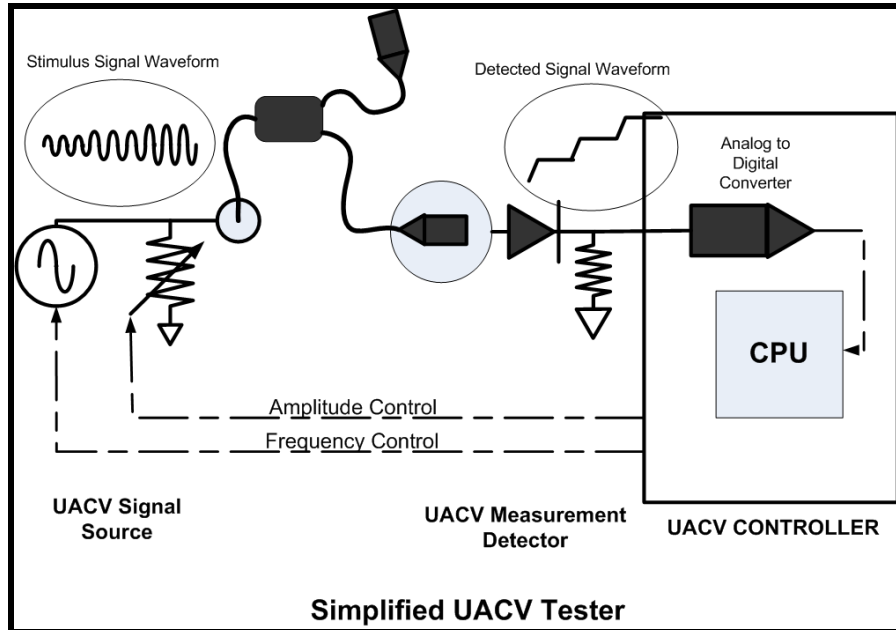   3. UACV Controller

Figure 1 – Simplified Diagram of the UACV

The Signal Source Section has a sine wave generator that is frequency controlled by the UACV controller and an amplifier/attenuator section that is also managed by the UACV controller. The signal source is pure tone that is present at the input connector of the ACCES cables.

The Measurement Detector is made up of the PUCK/Microphone transducer section and a measurement amplifier and a linear diode detector. The Direct Current (DC) signal from the detector is routed to an Analog to Digital Converter (ADC) built into the UACV Controller. The ADC takes the 0 to 5 Volt DC level and measures the level in 256 increments.

The UACV Controller sets the input frequency and amplitude of the Stimulus signal, and then measures the resultant DC signal level from the detector. Firmware inside the controller determines any action that is necessary depending on the amplitude level of the detected signal.

The main purpose of the firmware (firmware is the controller operating instructions stored in its internal memory) related to the intermittent testing is focused on setting a consistent listening level for the operator when performing the test. This is not trivial because the various types of ACCES cables have up to 70 dB of variation across frequency and amplitude response due to differing communication system requirements. The heart of the intermittent test is the audio level setup. The controller uses a software feedback loop to adjust the input level to produce a resultant detected DC signal level. The goal of the feedback loop is to set each cable type so the operator hears the same tone at a consistent level for all ACCES cable types.

The Software Feedback loop works in the following way:

- The controller commands a low amplitude 3500 Hz Sine wave signal to be placed on a cable of the same type as the suspected intermittent cable.
- If the detected DC signal amplitude is below the" target level", the F1 LED turns yellow.
- If the level is above the "target level", the F3 LED turns yellow.
- Once the detected signal is above the "target level", the software loop decreases the level of the stimulus signal until detected DC signal falls within a predetermined "convergence window" around the "target level". The F3 LED stays illuminated as long as the measured level is above the "window". The F2 LED illuminates yellow once the target level falls within the "convergence window".
- The controller/software decreases the stimulus amplitude step size once the detected DC level is within the target "convergence window".
- The controller/software continues to converge as accurately as possible on the "target level".
- The F2 LED turns green once the detected DC level falls within 1 ADC measurement unit of the "target level".
- At this point the signal amplitude is held constant and the suspected intermittent cable is connected and the intermittent test can be started.

Figure 2 shows a circuit simulation of the input signal source being stepped and the resultant change in the detected DC level.
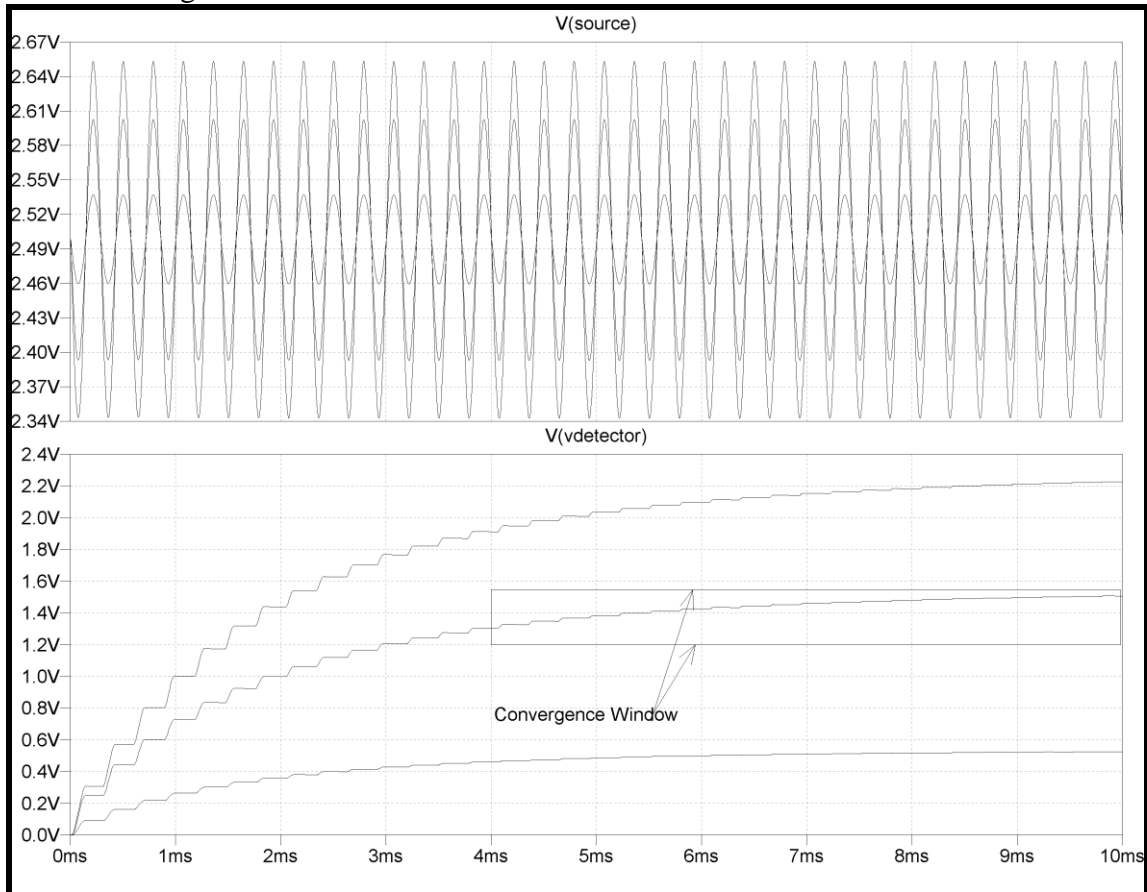

Figure 2: Simulation of Signal Source (top traces) and Detected output (bottom traces)

ACCES Cable Test Procedures

Verification Test
A verification test should be accomplished at least once a day prior to cable testing.

1. Turn the Power Switch to "ON". The UACV will accomplish the lamp test. The POWER LED will periodically flash Green when the test set is ready.
2. Remove the verification cable from its storage location. Verify the cable serial number matches the UAVC tester serial number.
3. Place the verification cable two-pin connector into the two-pin SIGNAL SOURCE receptacle.
4. Place the speaker portion of the verification cable into the puck per the speaker insertion technique. (Figure A6-1)
5. Place the Cable Selector to the "VER" position.
6. Press and release the Execute button. Observe that the POWER LED light no longer flashes which indicates the test was initiated.
7. Observe the F1/F2/F3 LED's for indications. F1 and F2 LED's will indicate Yellow as the test progresses. At the end of the test, either all LED's will be Green (Pass) or one or more LED's will be Red and will flash three times. A flashing Red LED indicates a failure at that frequency (See Table 1 for corrective actions).
8. Remove the Verification Cable and place in its storage location.
9. Turn Power Switch to "OFF".

Speaker insertion technique:

A. Locate the ACCES Speaker over the PUCK in the UACV as shown.
B. Position the top end of the Speaker at an angle into the PUCK as shown.
C. Push down on the cable end of the Speaker and seat into the retaining groove built into the PUCK. Twist the speaker side to side to ensure it is seated. The top flange should be flush with the surface of the PUCK.
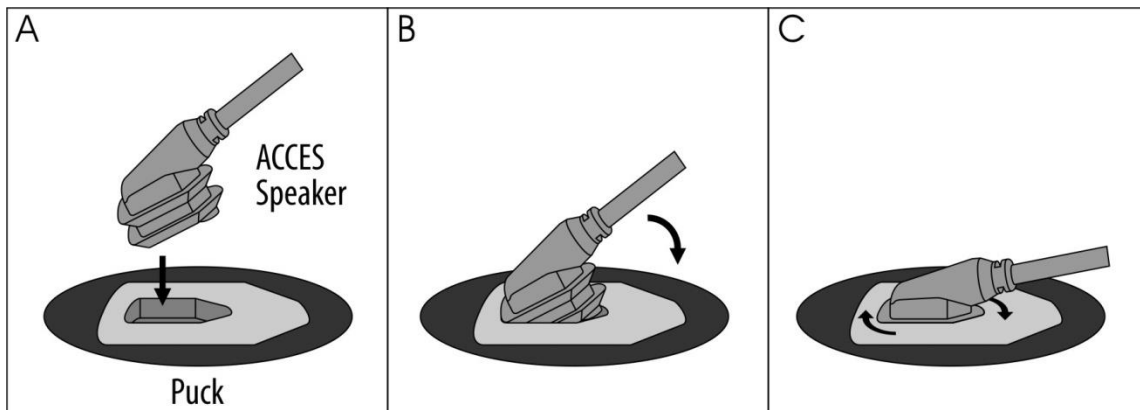

Figure A6-1, Speaker Insertion Technique

ACCES Cable Test (part # 79801, 79802, or 79803)
1. Turn the Power Switch to "ON".
2. Place the two-pin connector of the ACCES cable to be tested into the two-pin SIGNAL SOURCE receptacle.
3. Place one of the speakers of the ACCES cable into the puck IAW the speaker insertion technique. (Figure A6-1)
4. Place the Cable Selector to the appropriate position (refer to the CABLE TEST CHART on the instruction card located in the lid of the UACV).
5. Press and release the Execute button. Observe that the POWER LED light no longer flashes which indicates the test was initiated.

NOTE
If the F1/F2/F3 LED's momentarily flash yellow once after the EXECUTE button has been pressed it is an indication that the test set has sensed at least a 2.5 degree Celsius change in temperature. It is recommended that a verification test be accomplished prior to testing any cables.

NOTE
If the F1/F2/F3 LED's momentarily flash yellow twice after the EXECUTE button has been pressed it is an indication that the test set has sensed at least a 5 degree Celsius change in temperature. It is strongly recommended that a verification test be accomplished prior to testing any cables.

6. Observe the F1/F2/F3 LED's for indication (Steady Green = Pass, Blinking Red = Fail at that frequency).
7. Remove speaker from the Puck and insert the other speaker IAW the speaker insertion technique.
8. Press and release the Execute button. Observe that the POWER LED light no longer flashes which indicates the test was initiated.
9. Observe the F1/F2/F3 LED's for indication (Steady Green = Pass, Flashing Red = Fail at that frequency).
10. Remove the speaker from the Puck.
11. Remove the two-pin connector from the two-pin SIGNAL SOURCE receptacle.
12. Turn the Power Switch to "OFF" if no further cable testing is to be accomplished.

ACCES Cable Test (Part # 79812)
1. Turn the Power Switch "ON".
2. Connect the SMB connector on the cable to be tested to the SMB SIGNAL SOURCE connector.
3. Place one of the speakers of the ACCES cable into the puck IAW the speaker insertion technique.

4. Place the Cable Selector to the appropriate position (refer to the CABLE TEST CHART on the instruction card located in the lid of the UACV).
5. Press and release the Execute button. Observe that the POWER LED light no longer flashes which indicates the test was initiated.

Indication	Meaning	User Response
Power LED flashes GREEN once each second	Battery Voltage is normal.	N/A
Power LED solid RED	Battery Voltage is < 2.2 Volts	Replace batteries
One or more F1/F2/F3 LED's flash RED 3 times	Verification cable is showing a failed indication at the indicated (F1/F2/F3) frequency	CABLE SELECTOR set to VER; Verification cable inserted; EXECUTE button Pressed Retest to verify failure. If failure is confirmed, return test set to manufacturer for maintenance.
F1/F2/F3 LED's all flash RED momentarily.	There are no cable parameters programmed in the selected Function Selector position	CABLE SELECTOR set; cable under test inserted; EXECUTE button Pressed *(Applies to both Verification Cable and any ACCES cable)* Use appropriate position for the cable type being tested. If selected position is correct, return unit to Westone for reprogramming.
F1/F2/F3 LED's all flash yellow once.	Temperature of UACV has changed by approx 2.5 degrees Celsius since the last VER calibration	CABLE SELECTOR set; cable under test inserted; EXECUTE button Pressed *(Does not apply to the Verification Cable)* Recommend performing VER calibration.
F1/F2/F3 LED s all flash yellow Twice.	Temperature of UACV has changed by approx 5 degrees Celsius since the last VER calibration	CABLE SELECTOR set; cable under test inserted; EXECUTE button Pressed *(Does not apply to the Verification Cable)* Strongly Recommend performing VER calibration.
After 1.5 seconds measures begin to complete: F1/F2/F3 LED's turn steady GREEN in sequence.	Cable Passes the test.	CABLE SELECTOR set; cable under test inserted; EXECUTE button Pressed *(Does not apply to the Verification Cable)*
After 1.5 seconds measures begin to complete: F1/F2/F3 LED's illuminate in sequence. One or more LED's flash RED three times.	Cable is showing a failed condition at the indicated (F1/F2/F3) frequencies.	CABLE SELECTOR set; cable under test inserted; EXECUTE button Pressed *(Does not apply to the Verification Cable)* Retest to verify failure. If failure is confirmed, return cable to Westone.

Table A6-1, UACV LED Indicators

NOTE
If the F1/F2/F3 LED's momentarily flash yellow once after the EXECUTE button has been pressed it is an indication that the test set has sensed at least a 2.5 degree Celsius change in temperature. It is recommended that a verification test be accomplished prior to testing any cables.

NOTE
If the F1/F2/F3 LED's momentarily flash yellow twice after the EXECUTE button has been pressed it is an indication that the test set has sensed at least a 5 degree Celsius change in temperature. It is strongly recommended that a verification test be accomplished prior to testing any cables.

6. Observe the F1/F2/F3 LED's for indication (Steady Green = Pass, Flashing Red = Fail at that frequency).
7. Remove speaker from the Puck and insert the other speaker IAW the speaker insertion technique.
8. Press and release the Execute button. Observe that the POWER LED light no longer flashes which indicates the test was initiated.
9. Observe the F1/F2/F3 LED's for indication (Steady Green = Pass, Flashing Red = Fail at that frequency).
10. Remove the speaker from the Puck.
11. Disconnect the SMB connector from the SIGNAL SOURCE connector.
12. Turn the Power Switch to "OFF" if no further cable testing is to be accomplished.

ACCES Cable Intermittent Test
1. Place an earpiece of a known "good" cable of the same type that has suspected intermitted performance into the PUCK measurement device on the UACV Panel and place the connector into the appropriate SIGNAL SOURCE connector.
2. Set the CABLE SELECTOR knob to "T7".
3. Press the EXECUTE button. The F1 or F3 LED will illuminate yellow. The LED's will bounce between F1 and F3 in a random fashion until the F2 LED illuminates yellow. A short time later the F2 LED will turn solid Green; this is the indication that at 3500Hz tone at a constant audio level is present.
4. Remove the known good cable from the UACV.
5. Place the suspected intermittent cable into the appropriate SIGNAL SOURCE connector on the UACV panel.
6. Place the suspected earpiece up to your ear and listen for a constant 3500Hz tone.
7. Bend the cable as necessary to isolate and verify the intermittent performance. Press EXECUTE again or turn the CABLE SELECTOR knob to exit the intermittent test mode.