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1 SCOPE -

This manual provides instructions for use and maintenance of the Bose® Product Improved Combat Vehicle Crewman (PICVC) Active Noise Reduction (ANR) Headset.

2 DESCRIPTION –

The Bose® PICVC Headset is a high performance communications headset and boom microphone intended for use with compatible military communications systems or intercoms. Its use and maintenance are critical to achieving its performance potential. The Bose® PICVC headset comes in medium and large sizes in two variations; with or without boom microphone installed.

As shown in the picture below, the headset includes Left and Right earcups. Foam ear cushions in the earcups seal them to a user’s head. A boom microphone is mounted on the Right earcup. A vehicle cable connected to the Left earcup is used to connect the headset to an intercom. The earcups are connected by an earcup cable which is not visible in the picture. The earcups are mounted in an impact liner for mounting on a user’s head.

The Left and Right earcups deliver communication signals from the intercom to the user’s ears. In addition, through the use of the ear cushions and proprietary electronic circuitry, they provide
passive and active noise reduction (or attenuation). The boom microphone delivers the user’s speech to the intercom. There is also a talk-thru microphone mounted on each earcup to permit communication while disconnected from the intercom.
3 FIT AND OPERATION –

The Bose® PICVC Headset provides high-intelligibility communication and high passive and active noise reduction (or attenuation) when properly fitted and adjusted. Proper fit and adjustment are described in this section, as is operation of the headset.

3.1 Fit and Adjustment. Consult Figure 3-1 – Figure 3-5. The headset should fit snugly on the head and be adjusted for maximum passive noise reduction.

NOTE

The Bose® PICVC Headset depends on proper fit and ear cushion seal to achieve its full communication capability and passive and active noise reduction. The ear cushions must be seated securely on the head without folds or leaks of any kind. The liner must be strapped snugly enough to ensure a good seal between the ear cushions and the head.

3.1.1 If this is the initial fitting of the headset, release the Velcro straps on the impact liner above each earcup and across the back at your neck (nape adjustment). Place the impact liner on your head with each ear entirely within the corresponding ear cushion.

3.1.2 Rotate the earcups, as required, to provide as much comfort as possible with the ear cushions tight against your head.

3.1.3 Take up slack in the Velcro straps at the back of your neck and then the straps above the earcups, Figure 3-1. Adjust tension so that the ear cushions are tight against your head with each ear totally enclosed within the ear cushion.
3.1.4 Place the outer shell over the impact liner so the rubber edging of the forehead portion of the outer shell is even with the edge of the browpad on the impact liner.

3.1.5 Push down on the outer shell to engage the Velcro patch on the top of the impact liner and the Velcro patch inside the outer shell.

3.1.6 Attach the snap fastener at the rear of the impact liner to the fastener at the rear of the outer shell, Figure 3-3.

3.1.7 Place the chinstrap under your chin and attach the chinstrap snap fasteners to each side of the impact liner. Adjust tension of the chinstrap to keep the ear cushions tight against your head.
To increase tension, pull on the webbing attached to the buckle; to release tension, pull the leather tab attached to the buckle, Figure 3-4

![Image of helmet with labels for leather tab and webbing]

Figure 3-4

3.1.8 Adjust the boom microphone to place the microphone directly in front of the mouth, ¼ inch from lips, Figure 3-5.

**NOTE**

The Microphone must be close to your lips for effective communication.

![Image of microphone positioned near lips]

Figure 3-5
3.1.9 If this has been the initial fitting of the headset, feel the strap attaching the strap fastener at the rear of the shell. If there is slack in the strap, remove the helmet and liner and adjust the strap to eliminate slack, Figure 3-4.

3.2 Operation

3.2.1 Communication is enabled by a Push-to-Talk (PTT) switch in the Left earcup, Figure 3-6. This switch turns the boom microphone on and off and connects separate PTT control lines to activate communication separately through the intercom and to the radio. The PTT switch operates as follows.

- **Center (latching) position**: boom microphone and both PTT lines disconnected
- **Rear (latching) position**: boom microphone and PTT Intercom line connected to intercom
- **Forward (momentary) position**: boom microphone and PTT Radio line connected to intercom

3.2.2 Active noise reduction is provided by circuitry in the earcups that generates counterwaves to external noise. Active noise reduction is enabled by an ANR switch in the Right earcup, Figure 3-6. The ANR switch operates as follows.

- **Rear position**: ANR enabled
- **Center position**: ANR disabled
- **Forward position**: Talk-thru enabled

3.2.3 Passive noise reduction is provided by the earcups and ear cushions and the seal between the ear cushions and the head.

---

**Figure 3-6**
PERIODIC INSPECTION AND MAINTENANCE.

To ensure proper operation of the Bose® PICVC Headset, it is necessary to inspect it periodically and replace damaged or worn components, and verify proper functioning after any replacement. To inspect the inner earcup, it is necessary to remove the ear cushion and front foam.

4.1 Tools Required for Periodic Inspection and Maintenance. It may be necessary to remove and replace some part of a headset to perform maintenance. See the list of required tools in Table 4-1 below.

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit, screwdriver, crossed tip, hex drive</td>
<td>Attach boom mic hardware</td>
</tr>
<tr>
<td></td>
<td>Attach sealing screws to outer cup</td>
</tr>
<tr>
<td></td>
<td>Tighten screws on PCB</td>
</tr>
<tr>
<td>Boom Stud Installation Tool</td>
<td>Removal/Replacement of boom stud</td>
</tr>
<tr>
<td></td>
<td>Bose® FP179500</td>
</tr>
<tr>
<td>Bit, screwdriver, flat tip, hex drive</td>
<td>Attach vehicle cable</td>
</tr>
<tr>
<td></td>
<td>Removal/Replacement of Microphone Element</td>
</tr>
<tr>
<td></td>
<td>Removal/Replacement of Battery Door</td>
</tr>
<tr>
<td>Screwdriver, Torque, zero to 10 inch-pounds</td>
<td>Used with crossed and flat tip screwdriver bits</td>
</tr>
<tr>
<td>Socket, 5/16 inch</td>
<td>Removal/Replacement of hex nut for switch assemblies</td>
</tr>
<tr>
<td>Wrench, Socket, Torque, zero to 12 inch-pounds</td>
<td>Used with socket</td>
</tr>
<tr>
<td>EMI Screen Insertion Tool</td>
<td>Removal/Replacement of EMI screen</td>
</tr>
<tr>
<td></td>
<td>Bose® FP173908</td>
</tr>
<tr>
<td>Tweezers and Nonmetallic Positioning Tool</td>
<td>Used for positioning wires and small parts during removal and replacement procedures</td>
</tr>
</tbody>
</table>

Table 4-1 - Equipment Required for Periodic Inspection and Maintenance

4.2 Removal and Replacement of Headset Components for Periodic Inspection and Maintenance.

**CAUTION**

Proper removal and replacement of headset components is vital to its proper functioning. If it is necessary to remove and replace a component for maintenance or any other purpose, follow the instructions found in the following sections of Appendix II.
Appendix II, Section 1: Liner and Earcup Assembly Removal and Replacement
Appendix II, Section 2: Ear Cushion and Front Foam Removal and Replacement
Appendix II, Section 3: Driver Screen Removal and Replacement
Appendix II, Section 4: Microphone Boom Assembly Removal and Replacement
Appendix II, Section 5: PTT or ANR/TT Switch Removal and Replacement
Appendix II, Section 6: Vehicle Cable Removal and Replacement
Appendix II, Section 7: Outer Earcup Assembly Removal and Replacement
Appendix II, Section 8: Earcup to Earcup Cable Removal and Replacement
Appendix II, Section 9: Inner Earcup Assembly Removal and Replacement

4.3 Verification of Replaced Components. Correct functioning of components replaced during maintenance may be verified using the equipment, setup, and procedure for Performance Verification.

4.4 Periodic Inspection and Maintenance. Follow the steps in the table below.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CONDITION</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liner (Medium or Large)</td>
<td>Cuts, tears, or other visible damage.</td>
<td>Replace liner or pads. (Appendix II, Section 1)</td>
</tr>
<tr>
<td>Ear cushion (removed from earcup)</td>
<td>Cuts, tears, or fraying in outer skin or inner foam.</td>
<td>Replace ear cushion. (Appendix II, Section 2)</td>
</tr>
<tr>
<td></td>
<td>Cracks or visible damage to plastic rim.</td>
<td>Replace ear cushion. (Appendix II, Section 2)</td>
</tr>
<tr>
<td></td>
<td>O-ring cut, torn, or abraded.</td>
<td>Replace O-ring.</td>
</tr>
<tr>
<td></td>
<td>Outer surface dirty or dusty.</td>
<td>Clean with water and damp cloth.</td>
</tr>
<tr>
<td>Front Foam (removed from earcup)</td>
<td>Tears, deterioration, separation of layers, excessive dirt.</td>
<td>Replace front foam. (Appendix II, Section 2)</td>
</tr>
<tr>
<td></td>
<td>Wet.</td>
<td>Allow to air dry and then reinstall.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CAUTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not squeeze dry. Squeezing may degrade performance.</td>
</tr>
<tr>
<td>Inner Earcup Assembly (ear cushion and front foam removed)</td>
<td>Cracks or other visible damage to housing.</td>
<td>Replace inner earcup assembly. (Appendix II, Section 8)</td>
</tr>
<tr>
<td>(see Figure 4-1)</td>
<td>EMI screen crushed or collapsed.</td>
<td>Replace EMI screen. (Appendix II, Section 3)</td>
</tr>
<tr>
<td>(see Figure 4-2)</td>
<td>Inner port screen dirty.</td>
<td>Clean inner port screen with fine brush.</td>
</tr>
<tr>
<td></td>
<td>Outer surface dirty or dusty.</td>
<td>Clean with water and damp cloth.</td>
</tr>
<tr>
<td>COMPONENT</td>
<td>CONDITION</td>
<td>CORRECTIVE ACTION</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Outer Earcup</td>
<td>Cracks or other visible damage to housing.</td>
<td>Replace outer earcup assembly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Appendix II, Section 7)</td>
</tr>
<tr>
<td></td>
<td>Pressure equalization port dirty.</td>
<td>Clear pressure equalization port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with a small wire or a paper clip.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CAUTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not insert wire deeper than</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2 inch (12.7 mm).</td>
</tr>
<tr>
<td></td>
<td>Outer surface dirty or dusty.</td>
<td>Clean with water and damp cloth.</td>
</tr>
<tr>
<td>Switch Assembly</td>
<td>Bent or broken shaft, lack of latching, or</td>
<td>Replace switch assembly.</td>
</tr>
<tr>
<td></td>
<td>momentary action.</td>
<td>(Appendix II, Section 5)</td>
</tr>
<tr>
<td></td>
<td>Paddle broken or missing.</td>
<td>Replace paddle.</td>
</tr>
<tr>
<td>Earcup Cable</td>
<td>Cuts, kinks, or fraying.</td>
<td>Replace earcup cable assembly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Appendix II, Section 8)</td>
</tr>
<tr>
<td>Vehicle Cable</td>
<td>Cuts, kinks, fraying or damage or corrosion</td>
<td>Replace vehicle cable assembly.</td>
</tr>
<tr>
<td></td>
<td>to connector.</td>
<td>(Appendix II, Section 6)</td>
</tr>
<tr>
<td>boom microphone Assembly</td>
<td>Cuts, kinks, or fraying of cable or damage</td>
<td>Replace boom microphone assembly.</td>
</tr>
<tr>
<td></td>
<td>to connectors.</td>
<td>(Appendix II, Section 4)</td>
</tr>
</tbody>
</table>
Figure 4-1

Inner Port Screen
Ensure screen is free from debris

EMI Screen
Ensure screen is not crushed or collapsed

Figure 4-2

Pressure Equalization Port
Ensure port is free from debris
5 PERFORMANCE VERIFICATION –

Performance of the Bose® PICVC Headset may be verified using the equipment, setup, and procedures below.

5.1 Definitions: The following definitions apply.

- **Background noise**: Hiss, crackle, hum, whine or buzz caused by internal or external source.
- **Instability**: Loud rumble or squeal caused by ANR system malfunction.
- **Overload**: Loud click, thump, or pop caused by buckling of driver diaphragm or saturation of electronics.
- **Pump**: Press the earcup quickly against the head, compressing the ear cushion to approximately half its uncompressed height.

5.2 Initial Performance Verification

This procedure is to be used as an initial verification of the functionality of the headset. This initial performance verification should help to identify the problem area, if there is a fault, or confirm that the headset is functioning at an acceptable level.

5.2.1 Initial Verification Procedure: (To troubleshoot a symptom, reference section 6: FAULT ISOLATION AND REPAIR)

5.2.1.1 Inspect headset for any obvious damaged or worn parts. Replace any damaged or work parts before proceeding.

5.2.1.2 Plug headset into a functioning intercom. With headset OFF your head, turn ANR on. Listen for any loud squeal or other unexpected noise from the headset. If unexpected noises are present, troubleshoot Single Earcup: Instability. To check ANR is functioning, remove ear cushions and foams. Place your hand over the exposed earcup cavity, covering it completely. If ANR is functioning, you will hear a squeal. If no squeal, ANR is likely not functioning. Troubleshoot Both Earcups; Faulty ANR, or Single Earcup; Faulty Communication or ANR, as appropriate.

5.2.1.3 Verify you have side-tone. You should hear yourself through both earcups as you speak into the microphone. If no side-tone, troubleshoot Both Earcups: Faulty Communication, Powered or Un-powered or Single Earcup: Faulty Communication or ANR.

Turn ANR on. Listen for ANR to be functional in both earcups. If no ANR troubleshoot Both Earcups; Faulty ANR, or Single Earcup; Faulty Communication or ANR as appropriate.

Turn on Talk-Through and verify you can hear outside conversation in both the left and right earcup. Cover the left then right side talk-through microphone to perform the test. If no Talk-Through, troubleshoot Talk-Through.

5.2.1.4 If the Initial Performance Verification does not identify a performance problem, proceed to section 5.2 and perform a complete Performance Verification.
5.3 Equipment Required for Performance Verification. The equipment required for performance verification consists of the following or equivalents.

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>CHARACTERISTICS</th>
<th>SOURCE</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 DC Power Supply</td>
<td>0-30 Vdc, 0-200 mAdc</td>
<td>Hewlett-Packard</td>
<td>6216A</td>
</tr>
<tr>
<td>1 Digital Multimeter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 VIS Intercom</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troubleshooting Box</td>
<td>N/A</td>
<td>Bose</td>
<td></td>
</tr>
<tr>
<td>Interconnecting cables</td>
<td>N/A</td>
<td>as required</td>
<td>as required</td>
</tr>
</tbody>
</table>

5.4 Check Operating Voltage

5.4.1 Connect the HUT to the test box and connect the test box to a functioning intercom.

5.4.2 Check for 24VDC between TP7 and TP3 on the test box. If no 24VDC, verify operation of the intercom.

5.4.3 Else, proceed to Section 6 and troubleshoot Both Earcups; Faulty Communication or ANR.

5.5 Operating Current Verification. Operating current must be verified before performance verification to ensure that power connections in the headset are correct.

5.5.1 Set the power supply voltage to 24 +0/-1 Vdc and power supply current limit to 200mA.

5.5.2 Connect the Headset Under Test (HUT) as shown in Figure 5.3.2-1.

![Figure 5.3.2-1 Equipment Setup for Testing](image-url)
**Figure 5.3.2-1** Headset Test Cable 1

**Table 5.3.2-2** Vehicle Cable Connections

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>VEHICLE CONNECTOR (Same as TP on Test Box)</th>
<th>PCB CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shield</td>
<td>Pin 1</td>
<td>Shield wire</td>
</tr>
<tr>
<td>PTT</td>
<td>Pin 2</td>
<td>pin 2</td>
</tr>
<tr>
<td>Ground</td>
<td>Pin 3</td>
<td>pin 6</td>
</tr>
<tr>
<td>Mic Ground</td>
<td>Pin 4</td>
<td>pin 4</td>
</tr>
<tr>
<td>Audio Signal</td>
<td>Pin 5</td>
<td>pin 3</td>
</tr>
<tr>
<td>Mic Signal</td>
<td>Pin 6</td>
<td>pin 5</td>
</tr>
<tr>
<td>Power</td>
<td>Pin 7</td>
<td>pin 7</td>
</tr>
</tbody>
</table>
Figure 5.3.2-3  AP107 Connector Pin Layout
5.5.3 Verify that power supply current is in the appropriate range. Change the switch on the troubleshooting box to “I” (current) and connect DVM between pins 7 and R on the troubleshooting box. Set the DVM to read mVdc. Allowable readings are 45 to 65 mVdc. This corresponds to a current reading of 45 – 65 mA. This is also the range with the boom microphone disconnected. If power supply current is not in the appropriate range, proceed to the section on Fault Isolation and Repair, Operating Current, section 6.7. Otherwise continue with the Verification Procedure below. Follow the steps below with the HUT fitted snugly on your head. The order of the steps is not critical and may be changed if desired.

5.5.4 Communication, ANR On.

5.5.5 Place the ANR switch in the ANR On (rear latched) position and the PTT switch in the rear, latched, position. Speak into the boom microphone.

5.5.6 Verify that communication signal is clear and free from unusual or abnormal background noise and instability at all times.

5.5.7 Communication, ANR Off.

5.5.7.1 Place the ANR switch in the ANR Off (center) position and the PTT switch in the rear, latched, position. Speak into the boom microphone.

5.5.7.2 Verify that communication signal is clear and free from background noise and instability at all times.

5.5.8 Communication, Switch Operation.

5.5.8.1 Place the PTT switch in the rear, latched, position. Speak into the boom microphone while switching the ANR switch on and off.

5.5.8.2 Verify that communication signal is clear and free from background noise and instability at all times.

5.5.8.3 Speak into the boom microphone while switching the PTT switch from the center, OFF, position to the forward, momentary and rear, latched, position.

5.5.8.4 Verify that the boom microphone signal is off with the PTT switch in the center position and on with the switch in either the forward or the rear position.

5.5.9 ANR Operation in Quiet Environment. If possible, perform this test in ambient noise of 55 dB(A)SPL or lower to establish a noise level reference

5.5.9.1 Place the ANR switch in the rear latched, ANR ON position and the PTT switch in the center, OFF, position. Shake your head, move your jaw and pump the earcups several times. Repeat this step with PTT in rear, ON, position.

5.5.9.2 Verify that there is no instability or overload at any time.

5.5.9.3 Place the ANR switch in the ANR on position and the PTT switch in the center, OFF, position. Lift the edge of one earcup and then the other, to cause a leak between the ear cushion and the head.

5.5.9.4 Verify that there is no instability at any time.

5.5.9.5 Place the ANR switch in the rear latched, ANR ON position and the PTT switch in the center, OFF, position.

5.5.9.6 Verify that background noise is reduced and there is no instability at any time.
ANR Operation in Noise. If possible, perform this test in ambient noise of 95 dB(A)SPL or higher. Place the ANR switch in the rear latched, ANR ON position and the PTT switch in the center, OFF, position. Shake your head, move your jaw and pump the earcups. Verify ANR is each earcup and that there is no instability or overload at any time.

5.5.10 Verify PTT Switch, PTT Lines. Turn off power for this step.

5.5.10.1 Disconnect HUT from intercom.

5.5.10.2 Connect the ohmmeter between pin 2 (PTT) and pin 3 (GND) of the Troubleshooting box.

5.5.10.3 Set the PTT Switch to the Center, Off position and verify that the ohmmeter reading is greater than 1.36KΩ.

5.5.10.4 Set the PTT Switch to the Rear, Latched, ON Position and verify that the ohmmeter reading is 475Ω +/-5%.

5.5.10.5 Set the PTT Switch to the Forward, Momentary, ON Position and verify that the ohmmeter reading is less than 10Ω.

5.5.11 Communication, Talk-Thru.

5.5.11.1 Install known good battery in left earcup.

5.5.11.2 Set ANR/TT switch to the forward, latched, position and verify that ambient sounds can be clearly heard in both earcups.

5.6 DC MEASUREMENTS. Measurements may be made of boom microphone bias voltage, of resistances at the vehicle cable connector of a headset, and of continuity and isolation in individual cables in the Bose® PICVC Headset.

5.6.1 Resistances at Vehicle Cable Connector. DC resistances at the vehicle cable connector may point to a section of the table on Fault Isolation and Repair. Measurements should be made with a digital multimeter like a Fluke 8060A. The following resistances may be measured in a properly connected cable, headset, and boom microphone.

Table 5-2 Vehicle Cable, Headset, and boom microphone Measurements

<table>
<thead>
<tr>
<th>MEASUREMENT and ITEM(S) MEASURED</th>
<th>CABLE PINS</th>
<th>EXPECTED VALUE</th>
<th>IF SHORTED, SEE THIS SECTION:</th>
<th>IF OPEN, SEE THIS SECTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply input: power circuit and diode</td>
<td>pin 3 to pin 7</td>
<td>Open circuit (&gt;100 KΩ)</td>
<td>Operating Current: Headset Current</td>
<td>n/a</td>
</tr>
<tr>
<td>Audio input resistance: transformer primary</td>
<td>pin 3 to pins 5 and 1</td>
<td>500 Ω +/-10%</td>
<td>Both Earcups: Audio Short</td>
<td>Both Earcups: Faulty Communication</td>
</tr>
<tr>
<td>Ground to Mic Ground: ground wires</td>
<td>pin 3 to pin 4</td>
<td>Open circuit (&gt;100 KΩ)</td>
<td>Ground Short</td>
<td>n/a</td>
</tr>
<tr>
<td>Ground to Shield: ground wire and shield</td>
<td>pin 3 to pin 1</td>
<td>Open circuit (&gt;100 KΩ)</td>
<td>Ground Short</td>
<td>n/a</td>
</tr>
<tr>
<td>Mic Ground to Shield: ground wire and shield</td>
<td>pin 4 to pin 1</td>
<td>Open circuit (&gt;100 KΩ)</td>
<td>Ground Short</td>
<td>n/a</td>
</tr>
</tbody>
</table>
5.7 Cable Measurements.

5.7.1 Vehicle cable - Measure continuity from each vehicle connector pin to the connector pin at the other end. (ref Figure 5.3.2-2) Measure isolation between any 2 conductors.

5.7.2 Earcup cable - Measure continuity from each connector pin at one end of the cable to the corresponding pin at the other end and from the Shield wire ring terminal at one end of the cable to the Shield wire ring terminal at the other end. Measure isolation between any 2 conductors.
6 FAULT ISOLATION AND REPAIR –

If a headset malfunctions and visual inspection does not identify the cause of the malfunction, fault isolation and repair are necessary. This section provides direction for fault isolation and repair. It is organized as follows.

6.1 Definitions and Guiding Philosophy
6.2 Operating Current Verification
6.3 Fault Verification
6.4 Tools Required for Fault Isolation and Repair
6.5 Removal and Replacement of Headset Components for Fault Isolation and Repair
6.6 Symptom / Fault Troubleshooting Tree Diagram
6.7 Fault Isolation and Repair: Table of Faults and Corrective Actions
6.8 Symptom / Fault Troubleshooting Tree Diagram
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6.1 Definitions and Guiding Philosophy

6.1.1 Faults in headset operation are defined as follows.

- **Operating Current Fault.** Quiescent operating current above or below normal range, or power input shorted or open.

- **Faulty Communication.** No communication; or communication level wrong; or intermittent communication; or muddy or boomy communication; or noise, distortion, overload, or instability in communication, either in the headset earcups or through the boom mic.

- **Faulty ANR.** No ANR; or ANR level wrong; or intermittent ANR; or noise, distortion, overload, or instability in ANR operation.

- **Faulty Passive Noise Reduction.** Passive noise reduction below normal level.

- **Faulty PTT Operation.** Failure to activate the boom mic with the PTT switch.

- **Faulty TT Operation.** Failure of the Talk-Thru mic system.
6.1.2 Background noise, instability, and overload are defined in the section on Performance Verification.

6.1.3 Generally, fault isolation and repair will be accomplished by replacing faulty components with known good components. In several cases, however, measurements with a digital multimeter are specified to make the procedure more efficient.

6.1.4 It is expected that no more than one component is likely to fail at any one time without visible cause. Accordingly, when replacement of a component does not eliminate a fault, Fault Isolation and Repair dictates that the component shall be reinstalled and checked for elimination of the fault. This process avoids waste of good components.

6.2 Operating Current Verification. Operating current must be verified before repair is attempted to ensure that power connections in the headset are correct. Operating current may be verified using the Operating Current Verification equipment, setup and procedure described in the section on Performance Verification.

6.3 Fault Verification. A fault must be verified before repair is attempted. Faults may be verified using the procedure for Performance Verification (Section 5).

6.3.1.1 Equipment Required for Fault Verification and Isolation. Use the equipment and setup required for Performance Verification.

6.4 Tools Required for Fault Isolation and Repair. It may be necessary to remove and replace some part of a headset to perform fault isolation or repair. Fault isolation and repair may use the tools required for Periodic Inspection and Maintenance.

6.5 Removal and replacement of the Headset Components for Fault Isolation and Repair

6.6 Symptom / Fault Troubleshooting Tree. This tool is intended identify the likely faulty components for the major symptom categories. This chart, used in conjunction with the Fault Isolation and Repair procedures will make the troubleshooting experience more efficient.

6.7 Fault Isolation and Repair. Follow the steps in the section that relates to the fault in question. If this results in partial but not complete solution of a problem, proceed to the next applicable section to continue fault isolation and repair. If it is not possible to complete fault isolation and repair by following the steps, refer to equipment protocols for disposition of products.

**CAUTION**

Proper removal and replacement of headset components is vital to its proper functioning. If it is necessary to remove and for fault isolation, repair or any other purpose, follow the instructions found in Appendix II.
6.8 Symptom / Fault Troubleshooting Tree Diagram:

PICVC SYMPTOM / FAULT DIAGRAM

- **AUDIO PROBLEMS**
  - Microphone
  - Cables
  - Vehicle Cable
  - Cup-to-Cup Cable
  - PTT Switch f Leads
  - Right Outer Cup Ass'y
  - Microphone
  - Power / Current
  - Source / Intercom
  - Cable
  - Vehicle Cable
  - Cup-to-Cup Cable
  - Inner Cup

- **ANR PROBLEMS**
  - Audio
  - Both Sides
  - One Side
  - Power
  - Source / Intercom
  - Cable
  - Vehicle Cable
  - Cup-to-Cup Cable
  - ANR Switch f Leads
  - PCB
  - Inner Cup
  - PCB
  - Inner Cup PCB on Defective Side
  - Alkaline
  - Nicad (Re-Chargable)
  - Left Inner Cup PCB

- **TALK-THRU PROBLEMS**
  - Both Sides
  - One Side
  - Power
  - TT Switch
  - Power (On-Line Only)
  - Cup-to-Cup Cable
  - Battery (Off-Line Only)
  - Outer Cup (FT Mic)
  - Outer Cup
  - Battery
### 6.9 Table 6-1 Fault Isolation and Repair

<table>
<thead>
<tr>
<th>FAULT</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Current:</strong></td>
<td></td>
</tr>
<tr>
<td>Headset Current</td>
<td>Verify fault.</td>
</tr>
<tr>
<td></td>
<td>If fault verified, replace boom microphone assembly.</td>
</tr>
<tr>
<td></td>
<td>If current correct (45mA to 65mA), end repair; verify headset performance.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, open Left earcup and verify operating current.</td>
</tr>
<tr>
<td><strong>NOTE:</strong></td>
<td>It is not necessary to reassemble earcups before operating current fault is corrected, as long as they are handled gently to avoid stressing any of the headset wiring.</td>
</tr>
<tr>
<td></td>
<td>If current correct, suspect pinched wire in Left earcup; locate pinched wire, repair wire or replace corresponding cable or switch assembly, and reassemble Left earcup.</td>
</tr>
<tr>
<td></td>
<td>If mic was not the cause and current is correct, proceed to Operating Current: boom microphone Reinstallation to reinstall the original mic.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, open Left earcup and disconnect earcup cable (J1) and 2 shield wires(purple wires) Attached to earcup PCB at ring terminal near J1.</td>
</tr>
<tr>
<td></td>
<td>If operating current is in the range 23.5 to 38.5 mA, Left earcup current is normal; proceed to Operating Current: Right Earcup Current.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, replace earcup assembly.</td>
</tr>
<tr>
<td></td>
<td>If operating current is in the range 23.5 to 38.5 mA, Left earcup current is normal; proceed to Operating Current: Earcup Reconnection.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, reinstall original Left inner earcup assembly and replace vehicle cable.</td>
</tr>
<tr>
<td></td>
<td>If operating current is in the range 23.5 to 38.5 mA, Left earcup current is normal; proceed to Operating Current: Earcup Reconnection.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, replace earcup assembly.</td>
</tr>
<tr>
<td></td>
<td>If operating current is in the range 23.5 to 38.5 mA, Left earcup current is normal; proceed to Operating Current: Earcup Reconnection.</td>
</tr>
<tr>
<td><strong>Operating Current:</strong></td>
<td></td>
</tr>
<tr>
<td>boom microphone Reinstallation</td>
<td>Reinstall original boom microphone assembly.</td>
</tr>
<tr>
<td></td>
<td>If current correct, end repair; verify headset performance.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, replace boom microphone assembly.</td>
</tr>
<tr>
<td></td>
<td>If current correct, end repair; verify headset performance.</td>
</tr>
<tr>
<td><strong>Operating Current:</strong> Earcup Reconnection</td>
<td>Reconnect earcup cable and shield to J1 and shield return of PCB assembly of Left inner earcup assembly. If current correct, reassemble Left earcup. Otherwise, proceed to Operating Current: Right Earcup Current. If current still correct after reassembly, proceed to Operating Current: boom microphone Reinstallation.</td>
</tr>
</tbody>
</table>
OPERATING CURRENT: HEADSET CURRENT

1. VERIFY FAULT
   - REPLACE BOOM MICROPHONE
     - IS OPERATING CURRENT CORRECT?
       - Yes → END REPAIR AND VERIFY HEADSET PERFORMANCE
       - No → OPEN LEFT EARCUP AND VERIFY OPERATING CURRENT
         - IS OPERATING CURRENT CORRECT?
           - Yes → IS THERE A PINCHED WIRE?
             - Yes → REPAIR WIRE OR REPLACE DEFECTIVE CABLE OR SWITCH ASSEMBLY
             - No → REASSEMBLE LEFT EARCUP
           - No → DISCONNECT EARCUP CABLE AND SHIELD FROM J1 AND SHIELD RETURN FROM PCB ASSEMBLY
             - NO → IS OPERATING CURRENT CORRECT?
               - Yes → PROCEED TO OPERATING CURRENT: BOOM MICROPHONE REINSTALLATION
               - No → CONTINUED ON NEXT PAGE
OPERATING CURRENT: HEADSET CURRENT (CONTINUED)

FROM PREVIOUS PAGE

IS OPERATING CURRENT CORRECT?

Yes → LEFT EARSUP CURRENT IS NORMAL → PROCEED TO OPERATING CURRENT: RIGHT EARCUP CURRENT.

No → REPLACE LEFT EARCUP ASSEMBLY

IS OPERATING CURRENT CORRECT?

Yes → LEFT EARSUP CURRENT IS NORMAL → PROCEED TO OPERATING CURRENT: EARCUP RECONNECTION

No → REINSTALL ORIGINAL LEFT INNER EARCUP ASSEMBLY

REPLACE VEHICLE CABLE

IS OPERATING CURRENT CORRECT?

Yes → RECONFIRM FAULT

No → REPLACE EARCUP ASSEMBLY

Yes → RECONFIRM FAULT

No → REPLACE EARCUP ASSEMBLY

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OPERATING CURRENT: BOOM MIC RE-INSTALLATION

1. Reinstall original boom mic assembly.
2. Is operating current correct?
   - Yes: End repair and verify headset performance.
   - No: Replace boom mic.
3. Is operating current correct?
   - Yes: End repair and verify headset performance.
   - No: Reconfirm fault.
OPERATING CURRENT: EARCUP RECONNECTION

RECONNECT EARCUP CABLE AND SHIELD TO J1 AND SHIELD RETURN TO PCB ASSEMBLY OF LEFT INNER EARCUP ASSEMBLY

IS OPERATING CURRENT CORRECT?

No

PROCED TO:
OPERATING CURRENT: RIGHT EARCUP CURRENT

Yes

REASSEMBLE LEFT EARCUP

IS OPERATING CURRENT CORRECT?

Yes

PROCED TO:
OPERATING CURRENT: BOOM MIC REINSTALLATION

No

RECONFIRM FAULT
<table>
<thead>
<tr>
<th>Operating Current:</th>
<th>Reconnect earcup cable and shield to J1 and shield return (purple wire) of PCB assembly of Left inner earcup assembly. Then open Right earcup and verify operating current.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Earcup Current</td>
<td><strong>NOTE:</strong> It is not necessary to reassemble earcups before this fault is corrected, as long as they are handled gently enough to avoid stressing any of the headset wiring.</td>
</tr>
<tr>
<td></td>
<td>If current correct, suspect pinched wire in Right earcup; locate pinched wire, repair wire or replace corresponding cable or switch assembly, and reassemble Right earcup.</td>
</tr>
<tr>
<td></td>
<td>If current correct, proceed to Operating Current: Earcup Reconnection. Otherwise, open Right earcup if closed and disconnect Boom Mic connector from J2 (ref: Apx II, pg-13) of PCB assembly of Right inner earcup assembly.</td>
</tr>
<tr>
<td></td>
<td>If current is in the range 45 to 62 mA, replace earcup assembly. If current correct, reassemble Right earcup and proceed to Operating Current: Earcup Reconnection. Otherwise replace earcup assembly.</td>
</tr>
<tr>
<td></td>
<td>If current correct, reassemble Right earcup and proceed to Operating Current: Earcup Reconnection. Otherwise, reinstall original Right inner earcup assembly and replace earcup cable. If current correct, reassemble Right earcup and proceed to Operating Current: Earcup Reconnection. Otherwise, replace earcup assembly.</td>
</tr>
<tr>
<td></td>
<td>If current correct, reassemble Right earcup and proceed to Operating Current: Earcup Reconnection.</td>
</tr>
</tbody>
</table>

If current correct, reassemble Right earcup and proceed to Operating Current: Earcup Reconnection.
OPERATING CURRENT: RIGHT EARCUP CURRENT

RECONNECT EARCUP CABLE AND SHIELD TO J1 AND SHIELD RETURN TO PCB ASSEMBLY OF LEFT INNER EARCUP ASSEMBLY

OPEN RIGHT EARCUP AND VERIFY OPERATING CURRENT

IS OPERATING CURRENT CORRECT?  Yes → IS THERE A PINCHED OR BROKEN WIRE?  Yes → REPAIR WIRE OR REPLACE CORRESPONDING CABLE OR SWITCH ASSEMBLY

No → DICCONNECT BOOM MIC CONNECTOR FROM J2 OF RIGHT INNER EARCUP ASSEMBLY

IS OPERATING CURRENT CORRECT?  No → REASSEMBLE RIGHT EARCUP IS OPERATING CURRENT CORRECT?  No → REASSEMBLE RIGHT EARCUP

IS THERE A PINCHED OR BROKEN WIRE?  Yes → PROCEED TO OPERATING CURRENT EARCUP RECONNECTION

No → REPLACE RIGHT EARCUP ASSEMBLY

TO NEXT PAGE
OPERATING CURRENT: RIGHT EARCUP CURRENT
(CONTINUED)

FROM PREVIOUS PAGE

IS OPERATING CURRENT CORRECT?
Yes → REASSEMBLE RIGHT EARCUP → PROCEED TO: OPERATING CURRENT: EARCUP RECONNECTION
No → REINSTALL ORIGINAL RIGHT INNER EARCUP ASSEMBLY

REPLACE EARCUP CABLE

IS OPERATING CURRENT CORRECT?
Yes → REASSEMBLE RIGHT EARCUP → PROCEED TO: OPERATING CURRENT: EARCUP RECONNECTION
No → REPLACE EARCUP ASSEMBLY IS OPERATING CURRENT CORRECT?

IS OPERATING CURRENT CORRECT?
Yes
No

RECONFIRM FAULT
| Both Earcups: Faulty Communication, Powered or Unpowered | Verify fault.  
Replace Boom Mic  
If communication is restored, proceed to **boom microphone**. End repair and verify headset performance.  
Otherwise, measure for audio short: NOTE: Disconnect test box from intercom. On the test box, jumper test points 1 and 5 together. Jumper test points 2,3,4. Measure resistance between TP 1 and TP 2.  
Normal DC resistance should be 500 ohms +/- . If measured DC resistance is a short, proceed to **Both Earcups: Audio Short** (pg. 36).  
**NOTE:** If communication is restored in Left earcup ONLY at any point in the following sequence, proceed to Single Earcup: Faulty Communication or ANR. Then reassemble Left earcup if open, verify communication, and proceed to **Both Earcups: boom microphone Reconnection**.  
Otherwise, replace vehicle cable. Continue to use external boom microphone until instructed otherwise.  
**NOTE:** It may not be necessary to reassemble earcups before this fault is corrected, as long as they are handled gently enough to avoid stressing any of the headset wiring.  
If communication restored, reassemble Left earcup if open, verify communication, and proceed to **Both Earcups: boom microphone Reconnection**.  
Otherwise, replace earcup assembly.  
If communication restored, reassemble Left earcup if open, verify communication, and proceed to **Both Earcups: boom microphone Reconnection**.  
Otherwise, replace vehicle cable.  
If communication restored, reassemble Left earcup if open, verify communication, and proceed to **Both Earcups: boom microphone Reconnection**.  
Otherwise, replace vehicle cable.  
If communication restored, reassemble Left earcup if open, verify communication, and proceed to **Both Earcups: boom microphone Reconnection**.  
Otherwise, replace vehicle cable. |  
| Both Earcups: boom microphone Reconnection | Reconnect boom microphone wires from the headset connector to the input of the Microphone Amplifier in the equipment setup.  
If communication remains restored, end repair; verify headset performance.  
Otherwise, proceed to **boom microphone**. |
BOTH EARCUPS: FAULTY COMMUNICATIONS, POWERED OR UNPOWERED

VERIFY FAULT

REPLACE BOOM MIC

COMMUNICATIONS RESTORED? No

PROCEED TO: "SINGLE EARCUP-AUDIO SHORT"

COMMUNICATIONS RESTORED? No

REPLACE VEHICLE CABLE

COMMUNICATIONS RESTORED? No

REPLACE EARCUP ASSEMBLY

COMMUNICATIONS RESTORED? No

RECONFIRM FAULT

END REPAIR AND VERIFY HEADSET PERFORMANCE

NOTE
IF COMMUNICATION IS RESTORED IN LEFT EARCUP ONLY AT ANY POINT IN THIS PROCEDURE, PROCEED TO "SINGLE EARCUP-FAULTY COMM OR ANR. THEN REASSEMBLE LEFT EARCUP IF OPEN, VERIFY HEADSET PERFORMANCE, AND PROCEED TO "BOTH EARCUPS: BOOM MIC RECONNECTION"
| **Both Earcups:** Audio Short | Verify fault.  
If fault verified, open Left earcup and measure for audio short.  

**NOTE:** It may not be necessary to reassemble earcups before this fault is corrected, as long as they are handled gently enough to avoid stressing any of the headset wiring.  

If short eliminated, suspect pinched wire in Left earcup; locate pinched wire, repair wire, or replace corresponding cable or switch assembly, and reassemble Left earcup.  

If short eliminated, end repair; verify headset performance.  

Otherwise, open Left earcup if closed and disconnect earcup cable and shield (purple wires) from J1 and shield return of PCB assembly.  

If short eliminated, proceed to **Both Earcups: Right Earcup Short (pg. 43)**.  

Otherwise, replace vehicle cable.  

If short eliminated, proceed to **Both Earcups: Earcup Reconnection (pg. 40)**.  

Otherwise, replace cup-to-cup cable, or earcup assembly.  

If short eliminated, proceed to **Both Earcups: Earcup Reconnection (pg. 40)**. |
BOTH EARS: AUDIO SHORT

1. Verify fault.
2. Open left earcup.
4. Has short been eliminated?
   - Yes: Proceed to check for pinched or broken wire.
   - No: Disconnect earcup cable and shield from J1, and shield return from PCB assembly.
5. Is there a pinched or broken wire?
   - Yes: Repair wire or replace corresponding cable or switch assembly.
   - No: Has short been eliminated?
6. Has short been eliminated?
   - Yes: End repair and verify headset performance.
   - No: Proceed to both earcups: reconnection.
7. Reassemble left earcup.

Continued on next page.
BOTH EARS: AUDIO SHORT
(CONTINUED)

FROM PREVIOUS PAGE

HAS SHORT BEEN ELIMINATED?

No

REPLACE EARCUP ASSEMBLY

HAS SHORT BEEN ELIMINATED?

No

RECONFIRM FAULT

Yes

PROCEED TO:
BOTH EARCUPS: EARCUP RECONNECTION
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| Both Earcups: Earcup Reconnection | Reconnect earcup cable and shield to J1 and shield return of PCB assembly of Left inner earcup assembly. If short eliminated, reassemble Left earcup. Otherwise proceed to Both Earcups: Right Earcup Short. If short still eliminated after reassembly, proceed to Both Earcups: boom microphone Reconnection. |
BOTH EARCUPS: EARCUP RECONNECT

RECONNECT EARCUP CABLE AND SHIELD TO J1, AND SHIELD RETURN TO PCB ASSEMBLY OF LEFT INNER EARCUP ASSEMBLY

HAS SHORT BEEN ELIMINATED?  

No → PROCEED TO: BOTH EARCUPS: RIGHT EARCUP SHORT

Yes → REASSEMBLE LEFT EARCUP

HAS SHORT BEEN ELIMINATED?  

Yes → PROCEED TO: BOTH EARCUPS: BOOM MICROPHONE RECONNECTION

No → RECONFIRM FAULT
<table>
<thead>
<tr>
<th>Both Earcups:</th>
<th>Verify fault.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Earcup</td>
<td>If fault verified, reconnect earcup cable and shield to J1 and shield return of PCB assembly of Left inner earcup assembly. Then open Right earcup and measure audio short.</td>
</tr>
<tr>
<td>Short</td>
<td>NOTE: It may not be necessary to reassemble earcups before this fault is corrected, as long as they are handled gently enough to avoid stressing any of the headset wiring.</td>
</tr>
<tr>
<td></td>
<td>If short eliminated, suspect pinched wire in Right earcup; locate pinched wire, repair wire, or replace corresponding cable or switch assembly, and reassemble Right earcup.</td>
</tr>
<tr>
<td></td>
<td>If short eliminated, reassemble Right earcup, verify short still eliminated, and proceed to Both Earcups: Earcup Reconnection.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, replace earcup cable.</td>
</tr>
<tr>
<td></td>
<td>If short eliminated, reassemble Right earcup, verify short still eliminated, and proceed to Both Earcups: Earcup Reconnection.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, replace earcup assembly.</td>
</tr>
<tr>
<td></td>
<td>If short eliminated, reassemble Right earcup, verify short still eliminated, and proceed to Both Earcups: Earcup Reconnection.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, replace earcup cable.</td>
</tr>
<tr>
<td></td>
<td>Else, revisit initial fault determination.</td>
</tr>
</tbody>
</table>
BOTH EARCUPS: RIGHT EARCUP SHORT

1. **VERIFY FAULT**
2. **RECONNECT EARCUP CABLE AND SHIELD TO J1 AND SHIELD RETURN TO PCB ASSEMBLY OF RIGHT INNER EARCUP ASSEMBLY**
3. **MEASURE FOR AUDIO SHORT**
4. **HAS SHORT BEEN ELIMINATED?**
   - Yes: **IS THERE A PINCHED OR BROKEN WIRE?**
   - Yes: **REPAIR WIRE OR REPLACE CORRESPONDING CABLE OR SWITCH ASSEMBLY**
   - No: **REPLACE EARCUP CABLE**
5. **HAS SHORT BEEN ELIMINATED?**
   - Yes: **HAS SHORT BEEN ELIMINATED?**
   - No: **REPLACE EARCUP ASSEMBLY**
6. **HAS SHORT BEEN ELIMINATED?**
   - Yes: **RECONFIRM FAULT**
   - No: **REASSEMBLE RIGHT EARCUP**
7. **HAS SHORT BEEN ELIMINATED?**
   - Yes: **PROCEED TO: BOTH EARCUPS: EARCUP RECONNECTION**
   - No: **RECONFIRM FAULT**
| **Both Earcups:** Faulty ANR | Verify fault.  
**NOTE:** If ANR is restored in Right earcup ONLY at any point in the following sequence, proceed to section on Either Earcup: Faulty Communication or ANR to repair Left earcup.  
If fault verified, replace ANR switch assembly in Right earcup.  
**NOTE:** IT IS NECESSARY to reassemble earcups before checking repair of an ANR fault, because ANR depends on sealed earcups for its operation.  
**Test Set-Up:**  
- Connect Headset to Test Box  
- Connect test box to intercom  
- Apply power  
Check that 24v is present:  
Check 24v on test box TP1. If not, troubleshoot intercom.  
Else, Check 24v in left earcup, J5 (orange wire). If not, replace vehicle cable.  
Else, Check 24v in left earcup, J1 pin 6. If not – replace left earcup.  
Else, Check 24v in right earcup, J1, pin 6 (orange wire). If not replace cup-to-cup cable.  
If 24v and still no ANR, replace ANR switch.  
Else, replace right earcup assy.  
When ANR restored, end repair; verify headset performance. |
**BOTH EARCUPS: FAULTY ANR**

**VERIFY FAULT**

**CHECK FOR 24V ON TP1 OF TEST BOX**

**IS 24V PRESENT?**
- Yes
  - CHECK FOR 24V ON J5 (ORANGE WIRE) IN LEFT EARCUP
  - IS 24V PRESENT?
    - Yes
      - REPLACE LEFT EARSUP ASSEMBLY
    - No
      - REPLACE LEFT EARSUP ASSEMBLY
  - No
    - REPLACE VEHICLE CABLE

- No
  - TROUBLESHOOT INTERCOM

**IS 24V PRESENT?**
- Yes
  - IF 24V AND STILL NO ANR?
    - Yes
      - REPLACE ANR SWITCH
    - No
      - OTHERWISE, REPLACE RIGHT EARCUP ASSEMBLY
  - No
    - REPLACE EARCUP CABLE

**NOTE**
- IF ANR IS RESTORED IN RIGHT EARCUP ONLY AT ANY POINT IN THE FOLLOWING SEQUENCE, PROCEED TO EITHER EARCUP FAULTY COMMUNICATIONS OR ANR TO REPAIR LEFT EARCUP

**RECONFIRM FAULT**

**END REPAIR AND VERIFY HEADSET PERFORMANCE**
**Single (Left or Right) Earcup: Faulty Communication or ANR**

Verify fault.

**Test Set-Up:**
- Connect Headset to Test Box
- Connect test box to intercom
- Apply power

Check that 24v is present:
- Check 24v on test box TP7 and TP3. If not, troubleshoot intercom.
- Else, Check 24v in left earcup, J5 (orange wire) (ref: Appendix !!-13). If not, replace vehicle cable.
- Else, Check 24v in left earcup, J1 pin 6. If not – replace left earcup.
- Else, Check 24v in right earcup, J1, pin 6 (orange wire). If not replace cup-to-cup cable.
- If 24v and still no ANR, replace ANR switch.
- Else, replace right earcup assy.

When Communication or ANR restored, end repair; verify headset performance.

If fault eliminated, end repair; verify headset performance.
SINGLE EARCUPL: FAULTY COMMUNICATIONS or ANR

VERIFY FAULT

REPLACE THE AFFECTED EARCUPL ASSEMBLY

COMMUNICATION OR ANR RESTORED?

No

REPLACE EARCUPL CABLE AND REINSTALL ORIGINAL EARCUPL ASSEMBLY

COMMUNICATION OR ANR RESTORED?

No

REPLACE THE REMAINING EARCUPL ASSEMBLY AND REINSTALL ORIGINAL EARCUPL CABLE

COMMUNICATION OR ANR RESTORED?

No

RECONFIRM FAULT

Yes

END REPAIR AND VERIFY HEADSET PERFORMANCE
| Single Earcup: Background Noise or Overload | Verify fault.  
Test Set-Up: Refer to section 5.3.3  
If fault verified, replace earcup assembly.  
If noise or overload eliminated, end repair; verify headset performance. |
SINGLE EARCUP: FAULTY COMMUNICATIONS or ANR

VERIFY FAULT

REPLACE EARCUP ASSEMBLY

HAS NOISE OR OVERLOAD BEEN CORRECTED?

No

RECONFIRM FAULT

Yes

END REPAIR AND VERIFY HEADSET PERFORMANCE
| **Single Earcup:**  
| Instability: High Frequency Noise or Squeal | Verify fault.  
| | If fault verified, replace front foam assembly.  
| | If instability eliminated, end repair; verify headset performance.  
| | Otherwise, replace earcup assembly.  
| | If instability eliminated, end repair; verify headset performance. |
SINGLE EARCUP: INSTABILITY: HIGH FREQUENCY NOISE or SQUEAL

VERIFY FAULT

REPLACE FRONT FOAM ASSEMBLY

HAS INSTABILITY BEEN CORRECTED?

Yes

No

REPLACE EARCUP ASSEMBLY

HAS INSTABILITY BEEN CORRECTED?

Yes

No

RECONFIRM FAULT

END REPAIR AND VERIFY HEADSET PERFORMANCE
| **Single Earcup:**  
| Instability: Rumble | Verify fault.  
| | If fault verified, replace ear cushion and blue O-ring.  
| | If instability eliminated, end repair; verify headset performance.  
| | Otherwise, replace inner earcup O-ring (yellow).  
| | If instability eliminated, end repair; verify headset performance.  
| | Check that ports are not clogged (ref: pg. 8, Table 5.4.1)  
| | Otherwise, replace inner earcup assembly.  
| | If instability eliminated, end repair; verify headset performance. |
SINGLE EARCUP: INSTABILITY: Rumble

1. Verify Fault
2. Replace Earcushion Assembly
3. Has Instability Been Corrected?
   - Yes
   - Replace Inner Earcup O-Ring
     - Has Instability Been Corrected?
       - Yes
       - End Repair and Verify Headset Performance
       - No
       - Replace Inner Earcup Assembly
         - Has Instability Been Corrected?
           - Yes
           - End Repair and Verify Headset Performance
           - No
           - Reconfirm Fault

| **Single Earcup:** Low Passive Attenuation | Verify fault.  
If fault verified, replace ear cushion.  
If attenuation restored, end repair; verify headset performance.  
Otherwise, replace inner earcup O-ring.  
If attenuation restored, end repair; verify headset performance.  
Otherwise, replace earcup assembly.  
If attenuation restored, end repair; verify headset performance. |
SINGLE EARCUP: LOW PASSIVE ATTENUATION

VERIFY FAULT

REPLACE EARCUSHION ON EFFECTED EARSUP

HAS ATTENUATION BEEN RESTORED?

No

REPLACE INNER EARCUP O-RING

Yes

HAS ATTENUATION BEEN RESTORED?

No

REPLACE EARCUP ASSEMBLY

Has ATTENUATION BEEN RESTORED?

Yes

RECONFIRM FAULT

END REPAIR AND VERIFY PERFORMANCE
**boom microphone:**

<table>
<thead>
<tr>
<th>Signal short / Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verify the intercom is working properly.</td>
</tr>
<tr>
<td>Verify audio is working and that you can hear communications from the intercom.</td>
</tr>
<tr>
<td>If fault verified, replace boom microphone assembly.</td>
</tr>
<tr>
<td>If signal restored, end repair; verify headset performance.</td>
</tr>
<tr>
<td>Otherwise, open Left and Right earcups, place the PTT switch in its rear, latched position and check continuity sequentially from point to point in the first column of the table below and then from point to point in the second column. An open circuit between any 2 points in either column indicates a fault in the assembly identified in the third column.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check Continuity between Vehicle Cable pin 4 (Mic Ground) and:</td>
<td>Check Continuity between Vehicle Cable pin 6 (Mic Signal) and:</td>
<td>If open – Likely Failed Component:</td>
</tr>
<tr>
<td>Left earcup J5 pin 4</td>
<td>Left earcup J5 pin 5</td>
<td>Vehicle Cable</td>
</tr>
<tr>
<td>Left earcup J1 pin 3</td>
<td>Left earcup J1 pin 4</td>
<td>Left earcup</td>
</tr>
<tr>
<td>Right earcup J1 pin 3</td>
<td>Right earcup J1 pin 4</td>
<td>Earcup cable</td>
</tr>
<tr>
<td>Right earcup J2 pin 3</td>
<td></td>
<td>Right earcup</td>
</tr>
<tr>
<td>Mic connector pin 3</td>
<td></td>
<td>Mic wire</td>
</tr>
</tbody>
</table>

If vehicle or earcup cable is identified as faulty, replace it.
If signal restored, end repair; reassemble earcups and verify headset performance.
If Mic wire is identified as faulty, replace right outer earcup assembly.
If signal restored, end repair; reassemble earcups and verify headset performance.
If Right earcup is identified as faulty, replace right inner earcup assembly.
If signal restored, end repair; reassemble earcups and verify headset performance.
If Left earcup is identified as faulty, replace left inner earcup assembly.
If signal restored, end repair; reassemble earcups and verify headset performance.
Otherwise, replace PTT switch assembly and reinstall original Left inner earcup assembly.
If signal restored, end repair; reassemble earcups and verify headset performance.
Otherwise, replace (which one?) earcup assembly.
If signal restored, end repair; reassemble earcups and verify headset performance.

Note: Reinstall each of the original components from the sequence.
above, one at a time, to determine which components are at fault. If problem is not resolved, verify fault and continue troubleshooting.

| **boom microphone:** Signal Short | Verify fault. If fault verified, open Left earcup and measure signal short. **NOTE:** It is not necessary to reassemble earcups before this fault is corrected, as long as they are handled gently enough to avoid stressing any of the headset wiring! If short eliminated, suspect pinched wire in Left earcup; locate pinched wire, repair wire, or replace corresponding cable or switch assembly, and reassemble Left earcup. If short eliminated, end repair; verify headset performance. Otherwise, open Left earcup if closed and disconnect earcup cable and shield from J1 and shield return of PCB assembly. If short eliminated, proceed to **boom microphone:** Right Earcup Short. Otherwise, replace vehicle cable. If short eliminated, proceed to Reinstallation Sequence below. Otherwise, replace PTT switch assembly. If short eliminated, proceed to Reinstallation Sequence below. Otherwise, replace earcup assembly. If short eliminated, proceed to Reinstallation Sequence below. **Reinstallation Sequence:** Reinstall each of original items from sequence above except last one replaced, **one at a time,** and determine if short remains eliminated. If it does not, replace that item; if it does, leave that item installed and proceed to the next item. Then proceed to **boom microphone:** Earcup Reconnection. |
BOOM MICROPHONE: SIGNAL SHORT / OPEN

1. Verify Fault
2. Verify Intercom is Functioning
3. Replace Boom Microphone
4. Open Left & Right Earcup
5. Problem Resolved?
6. Yes: End Repair and Verify Headset Performance
7. No: Suspect PINched Wire:
   a. Check Mic Signal Path for Short
   b. Perform All Checks for Short
5. Was Short Found?
6. Yes: Repair Wire or Replace Corresponding Cable or Earcup Assembly
   a. Reassemble Earcup
   b. Problem Resolved?
   c. Yes: End Repair and Verify Headset Performance
   d. No: Reconfirm Fault
5. No: Suspect Open Signal Path:
   a. Check Mic Signal & Ground Path for Open
   b. Check All Connectors and Wiring for Loose or Intermittent Connection
   c. Problem Resolved?
   d. Yes: End Repair and Verify Headset Performance
   e. No: Reconfirm Fault
   f. Problem Resolved?
   g. Yes: End Repair and Verify Headset Performance
   h. No: Reconfirm Fault
BOOM MICROPHONE: SIGNAL SHORT / OPEN (CONTINUED)

FROM PREVIOUS PAGE

REPLACE VEHICLE CABLE

HAS SHORT/OPEN BEEN ELIMINATED?

Yes

REINSTALLATION SEQUENCE: REINSTALL EACH ORIGINAL ITEM FROM THIS SEQUENCE EXCEPT THE LAST ONE REPLACED, ONE AT A TIME, AND DETERMINE IF THE SYMPTOM REMAINS RESOLVED. IF IT DOES NOT, REPLACE THAT ITEM. IF IT DOES, LEAVE THAT ITEM INSTALLED AND PROCEED TO THE NEXT ITEM.

No

REPLACE PTT SWITCH

HAS SHORT/OPEN BEEN ELIMINATED?

Yes

No

REPLACE EARCUP ASSEMBLY

HAS SHORT/OPEN BEEN ELIMINATED?

Yes

END REPAIR AND VERIFY HEADSET PERFORMANCE

No

RECONFIRM FAULT
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| **boom microphone:** Earcup Reconnection | Reconnect earcup cable and shield to J1 and shield return of PCB assembly of Left inner earcup assembly.  
If short eliminated, reassemble Left earcup (being careful not to damage wires)  
Otherwise proceed to **boom microphone:** Right Earcup Short/Open (pg. 67).  
If short still eliminated after reassembly, end repair; verify headset performance. |
BOOM MICROPHONE: BOOM MICROPHONE RECONNECTION

RECONNECT EAR CUP CABLE AND SHIELD TO J1, AND SHIELD RETURN TO PCB ASSEMBLY OF LEFT INNER EAR CUP ASSEMBLY

HAS SHORT / OPEN BEEN ELIMINATED?

Yes

REASSEMBLE LEFT EAR CUP ASSEMBLY

HAS SHORT / OPEN BEEN ELIMINATED?

Yes

RECONFIRM FAULT

No

END REPAIR AND VERIFY HEADSET PERFORMANCE

PROCEED TO:
BOOM MICROPHONE RIGHT EAR CUP SHORT / OPEN
<table>
<thead>
<tr>
<th>boom microphone:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Earcup Short/Open</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
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<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>
BOOM MICROPHONE: RIGHT EARCUP SHORT / OPEN

1. **VERIFY FAULT**

2. **RECONNECT EARCUP CABLE AND SHIELD TO J1 AND SHIELD RETURN TO PAC ASSEMBLY OF LEFT INNER EARCUP ASSEMBLY**

3. **OPEN RIGHT EARCUP**

4. **MEASURE MIC SIGNAL SHORT / OPEN**

5. **HAS SHORT / OPEN BEEN ELIMINATED?**
   - **Yes**
     - **IS THERE A PINCHED OR BROKEN WIRE?**
     - **Yes**
       - **REPAIR WIRE OR REPLACE CORRESPONDING CABLE OR SWITCH ASSEMBLY**
     - **No**
       - **REASSEMBLE RIGHT EARCUP**
   - **No**
     - **REPLACE EARCUP CABLE**

6. **CONTINUED ON NEXT PAGE**

7. **HAS SHORT / OPEN BEEN ELIMINATED?**
   - **Yes**
     - **PROCEED TO: BOOM MICROPHONE EARCUP RECONNECTION**
   - **No**
     - **CONTINUE WITH DIAGNOSIS**
BOOM MICROPHONE: RIGHT EARCUP SHORT / OPEN (CONTINUED)

FROM PREVIOUS PAGE

HAS SHORT / OPEN BEEN ELIMINATED?

Yes

REINSTALLATION SEQUENCE: REINSTALL EACH ORIGINAL ITEM FROM THIS SEQUENCE EXCEPT THE LAST ONE REPLACED, ONE AT A TIME, AND DETERMINE IF THE SYMPTOM REMAINS RESOLVED. IF IT DOES NOT, REPLACE THAT ITEM. IF IT DOES, LEAVE THAT ITEM INSTALLED AND PROCEED TO THE NEXT ITEM.

No

REPLACE EARCUP ASSEMBLY

HAS SHORT / OPEN BEEN ELIMINATED?

Yes

REASSEMBLE RIGHT EARCUP

No

RECONFIRM FAULT

PROCEED TO: BOOM MICROPHONE: EARCUP RECONNECTION
This page intentionally left blank.
| PTT Switch: Faulty Communication/Incorrect PTT Line Resistance | Verify fault. If fault verified, replace PTT switch assembly. If fault eliminated, end repair; verify headset performance. Otherwise, replace vehicle cable. If fault eliminated, proceed to Reinstallation Sequence below. Otherwise, replace earcup assembly. If fault eliminated, proceed to Reinstallation Sequence below. Reinstallation Sequence: Reinstall each of original items from sequence above except last one replaced, one at a time, and determine if symptom remains solved. If it does not, replace that item; if it does, leave that item installed and proceed to the next item. After Reinstallation Sequence, end repair; verify headset performance. |
PTT SWITCH: FAULTY COMMUNICATION / INCORRECT PTT LINE RESISTANCE

1. Verify fault.
2. Replace PTT switch.
3. Has fault been eliminated? 
   - Yes: REINSTALLATION SEQUENCE:
     Reinstall each original item from this sequence except the last one replaced, one at a time, and determine if the symptom remains resolved. If it does not, replace that item. If it does, leave that item installed and proceed to the next item.
   - No: Replace vehicle cable.
4. Has fault been eliminated? 
   - Yes: Go to step 3.
   - No: Replace earcup cable.
5. Has fault been eliminated? 
   - Yes: Go to step 3.
   - No: Reconfirm fault.
| **Ground Short: Headset Short** | Verify fault.  
If fault verified, open Left earcup.  
NOTE: It is not necessary to reassemble earcups before this fault is corrected, as long as they are handled gently enough to avoid stressing any of the headset wiring.  
If short eliminated, suspect pinched wire in Left earcup; locate pinched wire, repair wire, or replace corresponding cable or switch assembly, and reassemble Left earcup.  
If short eliminated, end repair; verify headset performance.  
Otherwise, open Left earcup if closed and disconnect earcup cable and shield from J1 and shield return of PCB assembly.  
If short eliminated, proceed to **Ground Short: Right Earcup Short**.  
Otherwise, replace vehicle cable.  
If short eliminated, proceed to **Ground Short: Earcup Reconnection**.  
Otherwise, replace earcup assembly.  
If short eliminated, proceed to **Ground Short: Earcup Reconnection**.  
Otherwise, replace vehicle cable.  
If short eliminated, proceed to **Ground Short: Earcup Reconnection**. |

|  |  |
GROUND SHORT: HEADSET SHORT

1. VERIFY FAULT

2. OPEN LEFT EARCUP

3. HAS SHORT BEEN ELIMINATED?
   - Yes
   - No

   - IS THERE A PINCHED OR BROKEN WIRE?
     - Yes
     - Replace wire or replace corresponding cable or switch assembly
     - No

   - Replace left earcup

4. Replace vehicle cable

5. HAS SHORT BEEN ELIMINATED?
   - Yes
   - Proceed to: Ground short: earcup reconnection
   - No

   - Replace earcup cable

6. HAS SHORT BEEN ELIMINATED?
   - Yes
   - Proceed to: Ground short: right earcup short / open
   - No

   - Disconnect earcup cable and shield from J1 and shield return of PCB assembly
   - No

   - End repair and verify headset performance
| Ground Short: Earcup Reconnection | Reconnect earcup cable and shield to J1 and shield return of PCB assembly of Left inner earcup assembly. If short eliminated, reassemble Left earcup. Otherwise proceed to Ground Short: Right Earcup Short, pg: 77 If short still eliminated after reassembly, end repair; verify headset performance. |
GROUND SHORT: EARCUP RECONNECT

RECONNECT EARCUP CABLE AND SHIELD TO J1 AND SHIELD RETURN TO PCB ASSEMBLY OF LEFT INNER EARCUP ASSEMBLY

HAS SHORT BEEN ELIMINATED?

Yes

REASSEMBLE LEFT EARCUP

No

PROCEED TO: GROUND SHORT: RIGHT EARCUP SHORT

Has short been eliminated?

Yes

END REPAIR AND VERIFY HEADSET PERFORMANCE

No
| **Ground Short:** Right Earcup Short | Verify fault.  
If fault verified, reconnect earcup cable and shield to J1 and shield return of PCB assembly of Left inner earcup assembly. Then open Right earcup and measure audio short.  

**NOTE:** It is not necessary to reassemble earcups before this fault is corrected, as long as they are handled gently enough to avoid stressing any of the headset wiring.  

If short eliminated, suspect pinched wire in Right earcup; locate pinched wire, repair wire, or replace corresponding cable or switch assembly, and reassemble Right earcup.  

If short eliminated, reassemble Right earcup, verify short still eliminated and proceed to **Ground Short: Earcup Reconnection** (pg. 75). Otherwise, replace earcup cable.  

If short eliminated, reassemble Right earcup, verify short still eliminated and proceed to **Ground Short: Earcup Reconnection** (pg. 75). Otherwise, replace earcup assembly.  

If short eliminated, reassemble Right earcup, verify short still eliminated and proceed to **Ground Short: Earcup Reconnection** (pg. 75). Otherwise, replace earcup cable.  

If short eliminated, reassemble Right earcup, verify short still eliminated and proceed to **Ground Short: Earcup Reconnection** (pg. 75). |
GROUND SHORT: RIGHT EARCUP SHORT

VERIFY FAULT

RECONNECT EARCUP CABLE AND SHIELD TO J1 AND SHIELD RETURN TO PCB ASSEMBLY OF LEFT INNER EARCUP ASSEMBLY

OPEN RIGHT EARCUP

MEASURE AUDIO SHORT

HAS SHORT BEEN ELIMINATED?

Yes

IS THERE A PINCHED OR BROKEN WIRE?

Yes

REPAIR WIRE OR REPLACE CORRESPONDING CABLE OR SWITCH ASSEMBLY

No

REASSMABLE RIGHT EARCUP

No

HAS SHORT BEEN ELIMINATED?

Yes

REASSMABLE RIGHT EARCUP

No

RECONFIM FAULT

HAS SHORT BEEN ELIMINATED?

Yes

PROCEED TO: GROUND SHORT: EARCUP RECONNECTION

No

REASSMABLE RIGHT EARCUP
<table>
<thead>
<tr>
<th>Talk-Thru:</th>
<th>Verify fault with headset connected to functioning intercom.</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Side – No Talk-Thru</td>
<td>NOTE: Confirm you have 24v to the headset from the intercom.</td>
</tr>
<tr>
<td></td>
<td>If fault verified, Replace inner earcup on the side that is failing.</td>
</tr>
<tr>
<td></td>
<td>If fault is on the right side, and still no Talk-Thru on the right side after replacing the right inner earcup, then troubleshoot earcup cable for possible open wire from the TT Switch to the right earcup. Replace earcup cable as needed</td>
</tr>
<tr>
<td></td>
<td>If still no Talk-Thru on the right side, replace left inner earcup.</td>
</tr>
<tr>
<td></td>
<td>If the fault is on the left side and still no Talk-Thru after replacing the left inner earcup, troubleshoot possible wiring problem between TT switch and left earcup PCB. Replace TT switch if needed.</td>
</tr>
<tr>
<td>Both Sides – No Talk-Thru</td>
<td>Verify fault with headset connected to functioning intercom.</td>
</tr>
<tr>
<td></td>
<td>NOTE: Confirm you have 24v from the intercom to both earcups.</td>
</tr>
<tr>
<td></td>
<td>If fault verified, replace Talk-Thru switch.</td>
</tr>
<tr>
<td></td>
<td>If still no Talk-Thru on both sides, replace earcup cable.</td>
</tr>
<tr>
<td>No Talk-Thru on both sides with battery power</td>
<td>Verify fault.</td>
</tr>
<tr>
<td></td>
<td>Replace the battery with a known good battery. Be sure to insert the battery in the proper orientation (Positive / Negative and Rechargeable vs. Non-Rechargeable).</td>
</tr>
<tr>
<td></td>
<td>If still not Talk-Thru, open left earcup and check to see that battery power is available to PCB. 1.5V at J (X) P (Y).</td>
</tr>
<tr>
<td></td>
<td>If battery power is OK, replace left outer earcup.</td>
</tr>
<tr>
<td>Battery Not Charging</td>
<td>Verify Fault.</td>
</tr>
<tr>
<td></td>
<td>Verify 24V input from intercom and present at battery when headset is connected to the intercom. If no 24V, troubleshoot intercom.</td>
</tr>
<tr>
<td></td>
<td>Replace battery with new battery.</td>
</tr>
<tr>
<td></td>
<td>If problem not resolved, replace right inner earcup.</td>
</tr>
<tr>
<td></td>
<td>Verify headset performance.</td>
</tr>
<tr>
<td>Battery Looses Voltage too Quickly</td>
<td>Verify Fault.</td>
</tr>
<tr>
<td></td>
<td>Replace Battery.</td>
</tr>
<tr>
<td></td>
<td>Otherwise, check for shorted battery lead by check resistance on positive terminal to left earcup PCB ground. If short, check for pinched wire from battery. If no short, replace left inner earcup.</td>
</tr>
<tr>
<td></td>
<td>If problem not resolved, replace right inner earcup.</td>
</tr>
<tr>
<td></td>
<td>Verify headset performance.</td>
</tr>
</tbody>
</table>
TALK-THRU: ONE SIDE-NO TALK-THRU

1. Verify Fault

2. 24V Operating Voltage Present?
   - Yes
   - No → Troubleshoot Intercom

3. Replace outer earcup on the side that is failing

4. Talk-Thru Functioning?
   - Yes
   - No → Is fault on Right Side?

5. Is fault on Right Side?
   - Yes
   - No
      - Replace earcup cable

6. Replace earcup cable

7. Talk-Thru Functioning?
   - Yes
   - No → Replace right inner earcup

8. Replace right inner earcup

9. Talk-Thru Functioning?
   - Yes
   - No → Replace left inner earcup

10. Replace left inner earcup

11. TT switch functioning properly?
    - Yes
    - No
       - Replace TT switch

12. Replace TT switch

13. Verify Performance

14. Reconfirm Fault
TALK-THRU: BOTH SIDES-NO TALK-THRU

1. VERIFY FAULT
   2. 24V Operating Voltage Present?
      - Yes: Replace Talk-Thru switch
      - No: Talk-Thru Functioning?
         - Yes: Replace Cup-to-Cup Cable
         - No: Talk-Thru Functioning?
            - Yes: Replace Left Inner Cup
            - No: Replace Left Inner Cup

   Yes: Verify Performance
   No: Reconfirm Fault

Troubleshoot Intercom
TALK-THRU: NO TALK-THRU WITH BATTERY POWER
(Talk-Thru OK with Intercom Power)

- **VERIFY FAULT**
  - Replace battery with known good battery
  - Be sure to install the battery in the proper orientation (pos / neg & alkaline vs. rechargeable)
  - Talk-Thru Functioning?
    - **No**
      - Replace Left Inner Earcup
        - Talk-Thru Functioning?
          - **No**
            - Replace Left Outer Earcup
          - **Yes**
            - Talk-Thru Functioning?
              - **No**
                - Reconfirm Fault
              - **Yes**
                - Verify Performance

- **Yes**
TALK-THRU: BATTERY NOT CHARGING

VERIFY FAULT

24V Operating Voltage Present? No → Troubleshoot Intercom

Replace rechargeable battery with known good battery

Be sure you are using a fresh battery. Be sure to install the battery in the proper orientation (POS / neg & alkaline vs. rechargeable)

Is Battery Charging Properly? No → Replace left inner earcup

Is Battery Charging Properly?

Yes → Verify Performance

No → Reconfirm Fault
TALK-THRU: BATTERY DISCHARGING TOO QUICKLY

1. Verify Fault

2. 24V Operating Voltage Present?
   - No → Troubleshoot Intercom
   - Yes → Replace battery with known good battery

3. Be sure you are using a fresh battery. Be sure to install the battery in the proper orientation (pos / neg & alkaline vs. rechargeable)

4. Battery Holding Charge?
   - No → Replace Right Inner Earcup
   - Yes →
     - Positive Battery lead shorted to ground?
       - No → Replace left inner earcup
       - Yes → Repair Short or Replace outer earcup

5. Battery Holding Charge?
   - No → Reconfirm Fault
   - Yes →
     - Battery Holding Charge?
APPENDIX 1

ILLUSTRATED PARTS BREAKDOWN
<table>
<thead>
<tr>
<th>Ref #</th>
<th>NATO STOCK NUMBER</th>
<th>BOSE PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY/ASSY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5965-99-174-5504</td>
<td>294677-3-33</td>
<td>HEADSET, RO/CVC/ANR/B2 (Large)</td>
<td>REF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>294677-2-23</td>
<td>SIZE-MEDIUM (Medium)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5965-99-665-6497</td>
<td>279584-3 (Large)</td>
<td>LINER - MEDIUM</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>279584-2 (Medium)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>254954-1</td>
<td>BOOM MIC ASSY KIT</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>181409-1</td>
<td>MIC MOUNTING KIT</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>530599-684-4076</td>
<td>254957-1</td>
<td>SCREW</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>5310-99-665-6473</td>
<td>254947-1</td>
<td>THUMBNUT</td>
<td>1</td>
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<tr>
<td>21</td>
<td>5965-99-250-5361</td>
<td>254949-1</td>
<td>CLAMP</td>
<td>1</td>
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<td>31</td>
<td>5965-99-414-1186</td>
<td>254953-1</td>
<td>WINDSCREEN</td>
<td>REF</td>
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<tr>
<td>11</td>
<td>5965-99-799-3894</td>
<td>263273-1</td>
<td>EARCUP CABLE ASSEMBLY</td>
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<tr>
<td>16</td>
<td>5965-99-001-9853</td>
<td>287033-001</td>
<td>EAR CUSHION ASSEMBLY</td>
<td>2</td>
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<tr>
<td>26</td>
<td>8315-99-367-1806</td>
<td>263285-1</td>
<td>VELCRO PAD, LOOP</td>
<td>REF</td>
</tr>
<tr>
<td>29</td>
<td>6160-99-225-7800</td>
<td>251808-1</td>
<td>COVER, BATTERY COMPARTMENT</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>5305-99-238-1513</td>
<td>263303-1</td>
<td>SCREW, SEALING (NOT SHOWN)</td>
<td>6</td>
</tr>
<tr>
<td>25</td>
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APPENDIX 2

METHODS OF ASSEMBLY AND DISASSEMBLY
1 LINER AND EARCUP ASSEMBLY REMOval AND REPLACEMENT

1.1 Removal

1.1.1 Firmly grasp an earcup in one hand with thumb on the outer shell and fingers on ear cushion.

1.1.2 With other hand grasp liner above the earcup with thumb on the outside and finger on the inside of liner.

1.1.3 Firmly peel liner up and outward from earcup while at the same time use the thumb placed on outer shell to push earcup, and any attachments through liner opening until free.

1.1.4 Repeat steps 1 through 3 above for other earcup.

1.1.5 Undo Velcro straps securing earcup cable to the liner and separate earcups and cable assembly from liner.

**NOTE**

THE SIDE OF THE EARCUP(S) CONTAINING THE CORD ASSEMBLY CONNECTIONS(S) SHOULD BE POINTED TOWARDS THE REAR OF THE LINER WHEN PLACING THE EARCUPS INTO THE LINER OPENING.

1.2 Replacement

1.2.1 From the inside of the liner place earcup, with any attachments, part way through opening in the liner.

1.2.2 Start at the top of the liner opening and insert the liner ribbing into channel on earcup and hold in place.

1.2.3 While holding in place, start working liner ribbing into earcup channel on all around until full seated.

1.2.4 Repeat steps 1 through 3 for the other earcup.

1.2.5 Place earcup cable in Velcro at bottom rear of liner and secure.
2 EAR CUSHION AND FRONT FOAM REMOVAL AND REPLACEMENT

CAUTION
DO NOT ATTEMPT TO REMOVE THE EAR CUSHION BY PULLING ON THE
SOFT EAR SEAL MATERIAL.

2.1 Removal

2.1.1 Grasp ear cushion assembly lengthwise with thumb and fingers hooked under ear cushion
assembly lip.

2.1.2 Peel ear cushion assembly from earcup by tilting one end until free of earcup.

2.1.3 Remove front foam assembly from earcup.

2.2 Replacement

2.2.1 Insert front foam assembly into earcup.

2.2.2 Align ear cushion assembly on earcup.

2.2.3 Press ear cushion assembly firmly until secured in place to Velcro pads.
Ear Cushion and Front Foam Removal

Figure 2-1

Ear Cushion and Front Foam Detail

Figure 2-2
3 DRIVER SCREEN REMOVAL AND REPLACEMENT

3.1 Removal
3.1.1 Grasp ear cushion assembly lengthwise with thumb and fingers hooked under ear cushion assembly lip.
3.1.2 Peel ear cushion assembly from earcup by tilting one end until free of earcup.
3.1.3 Remove front foam assembly from earcup to expose driver screen.
3.1.4 Pry off the damaged driver screen and discard.

3.2 Replacement
3.2.1 Position replacement driver screen on inner earcup and push into place using driver screen press fixture.
3.2.2 Insert front foam assembly into earcup.
3.2.3 Align ear cushion assembly on earcup.
3.2.4 Press ear cushion assembly firmly until secured in place to Velcro pads.

Ear Cushion and Front Foam Removal

Figure 3-1
Ear Cushion and Front Foam Detail

Velcro loop pads
Velcro hook pads
Blue O-ring

Figure 3-2
4 MICROPHONE BOOM ASSEMBLY REMOVAL AND REPLACEMENT

4.1 Removal

4.1.1 Disconnect the boom microphone connector from the earcup.

4.1.2 Using a cross-tipped screwdriver, remove screw securing mounting hardware to headset.

4.1.3 Unscrew knurled thumbnut.

4.1.4 Remove boom clamp and boom assembly by sliding off mounting post.

4.2 Replacement

4.3 Place boom clamp on mounting post so that the serrated edge is flush against the boom mount and hold in place.

4.3.1 Place knurled thumbnut on mounting post and run clockwise and tighten until secure.

4.3.2 Using a cross-tipped screwdriver place screw in end of mounting post and tighten to 10.0 +/- .5 in-lbs (115 +/- 6 g-m).
5 PTT or ANR/TT SWITCH REMOVAL AND REPLACEMENT

5.1 Removal

5.1.1 Using a cross-tipped screwdriver, remove the two screws holding the switch guard to the outer cup assembly.

5.1.2 Using a cross-tipped screwdriver, remove the three sealing screws holding outer cup to the inner cup assembly.

5.1.3 Separate the outer and inner cup assemblies.

**CAUTION**
THE HEADSET CONTAINS A CIRCUIT BOARD SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD).

5.1.4 Using a flat head screwdriver, pry the paddle from the switch assembly.

5.1.5 Using a socket, remove the hex nut securing the switch to the outer cup plastic.

5.1.6 Remove switch from outer cup plastic and disconnect from circuit board. Cut away the sealant over the switch connector at the circuit board prior to removal.

5.2 Replacement

5.2.1 Assemble O-ring to switch before installing into earcup.

5.2.2 Install new switch into the outer cup plastic aligning the flat on the switch with the flat in the earcup and hold in place.

5.2.3 Secure switch to earcup with hex nut and tighten to 12.0 +/- 1 in-lbs. (138 +/- 11 g-m) using 5/16 in. (8mm) socket.

5.2.4 Press paddle into place on switch.

5.2.5 Plug connector at end of switch assembly into the circuit board and seal connection using sealant.

5.2.6 Assemble the inner and outer cup assemblies ensuring no wires are pinched. When assembling the inner and outer cup assemblies, be sure to twist the wiring 1½ to 2 turns such that the cable fits neatly into the earcup when assembled.

5.2.7 Secure outer cup in place using three sealing screws. Torque screws to 3.0 +/- .25 in-lbs. (35 +/- 3 g-m)
Sealing Screws Securing Outer and Inner Earcups

Separating Outer and Inner Cup Assemblies

Figure 5-1

PTT Switch Installed in Earcup

ANR Switch Installed in Earcup

O-ring

Hex Nut

Switch Assembly

Typical Cross Section of Switch Installed

Figure 5-2
Plug PTT Switch Connector into Circuit Board at J3 and Seal

Plug ANR Switch Connector into Circuit Board at J3 and Seal

Figure 5-3
6 VEHICLE CABLE REMOVAL AND REPLACEMENT

6.1 Removal

6.1.1 Using a cross-tipped screwdriver, remove the two screws holding switch guard to outer earcup assembly.

6.1.2 Using a cross-tipped screwdriver, remove the three sealing screws holding outer earcup to the inner earcup assembly.

6.1.3 Separate the outer and inner earcup assemblies.

CAUTION
THE HEADSET CONTAINS A CIRCUIT BOARD SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD).

6.1.4 Disconnect the vehicle cable assembly from the circuit board. Cut away the sealant over the switch connector at the circuit board prior to removal.

6.1.5 Using a cross-tipped screwdriver, loosen screw holding ring tongue terminal from vehicle cable to circuit board and remove ring tongue terminal.

6.1.6 Using a flat head screwdriver, loosen the two screws securing the vehicle cable to the earcup and remove the vehicle cable.

6.2 Replacement

6.2.1 Slide the vehicle cable through hole in earcup.

6.2.2 Plug connector at end of vehicle cable assembly into circuit board and seal connection using sealant.

6.2.3 Secure ring tongue terminal in place using cross-tipped screwdriver and torque screw to 2.0 +/- .2 in-lbs (23 +/- 2 g-m).

6.2.4 Push the vehicle cable grommet into tapered hole in earcup and hold in place.

6.2.5 Using flat head screwdriver, tighten the two screws on the vehicle cable to the earcup to 3.2 +/- .2 in-lbs. (37 +/- 2 g-m)

6.2.6 Assemble the inner and outer earcups ensuring no wires are pinched. When assembling the inner and outer cup assemblies, be sure to twist the wiring 1 ½ to 2 turns such that the cable fits neatly into the earcup when assembled.

6.2.7 Secure outer earcup in place using three sealing screws. Torque screws to 3.0 +/- .25 in-lbs. (35 +/- 3 g-m)
Sealing Screws Securing Outer and Inner Earcups

Separating Outer and Inner Cup Assemblies

Figure 6-1

Screw on Circuit Board to Securing Ring Tongue Terminal

Screws Securing Vehicle Cable to Earcup

Figure 6-2
Plug Vehicle Cable Connector into Circuit Board at J5 and Seal
Connect Ring Tongue Terminal to Screw

Figure 6-3
7 OUTER EARCUP ASSEMBLY REMOVAL AND REPLACEMENT

7.1 Removal

7.1.1 Using a cross-tipped screwdriver, remove the two screws holding switch guards to the outer earcups.

7.1.2 Using a cross-tipped screwdriver, remove the three sealing screws holding outer earcup to the inner cup assembly.

7.1.3 Separate the outer and inner earcup assemblies.

**CAUTION**

THE HEADSET CONTAINS A CIRCUIT BOARD SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD).

7.1.4 Disconnect all connections between left and right outer earcups to the circuit board. Cut away the sealant over the cable connectors at the circuit board prior to removal.

7.1.5 Using a cross-tipped screwdriver, loosen screw holding ring tongue terminal from earcup to earcup cable to circuit board and remove ring tongue terminal.

7.2 Replacement

7.2.1 Left Earcup Assembly

7.2.1.1 Plug connector at end of earcup to earcup cable assembly into circuit board at J1 and seal connection using sealant.

7.2.1.2 Plug connector at end of vehicle cable assembly into circuit board at J5 and seal connection using sealant.

7.2.1.3 Plug connector at end of battery terminal wires into circuit board at J2 and seal connection using sealant.

7.2.1.4 Plug green and white wires from the talk thru microphone into the connector from the PTT switch. Plug connector at end of PTT switch assembly into circuit board at J3 and seal connection using sealant.

7.2.2 Right Earcup Assembly

7.2.2.1 Plug connector at end of earcup to earcup cable assembly into circuit board at J1 and seal connection using sealant.

7.2.2.2 Plug connector at end of boom microphone wires into circuit board at J2 and seal connection using sealant.

7.2.2.3 Plug connector at end of ANR/TT switch assembly into circuit board at J3 and seal connection using sealant.
7.2.3 Secure ring tongue terminals from vehicle cable and earcup to earcup cable in place using cross-tipped screwdriver and torque screw to 2.0 +/- .2 in-lbs. (23 +/- 2 g-m)

7.2.4 Assemble the inner and outer earcups ensuring no wires are pinched. When assembling the inner and outer cup assemblies, be sure to twist the wiring 1 ½ to 2 turns such that the cable fits neatly into the earcup when assembled.

7.2.5 Secure outer earcup in place using three sealing screws. Torque screws to 3.0 +/- .25 in-lbs. (35 +/- 3 g-m)
8 EARCUP to EARCUP CABLE REMOVAL AND REPLACEMENT

8.1 Removal
8.1.1 Using a cross-tipped screwdriver, remove the three sealing screws holding outer earcup to the inner cup assembly.
8.1.2 Separate the outer and inner earcup assemblies.

CAUTION
THE HEADSET CONTAINS A CIRCUIT BOARD SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD).

8.1.3 Disconnect the earcup to earcup cable from the circuit board. Cut away the sealant over the earcup cable connector at the circuit board prior to removal.
8.1.4 Using a cross-tipped screwdriver, loosen screw holding ring tongue terminal from earcup to earcup cable to circuit board and remove ring tongue terminal.
8.1.5 Pull one end of the earcup to earcup cable assembly towards the inside of the earcup to expose the crimp ring and remove the crimp ring.
8.1.6 Remove the cable and grommet from earcup.
8.1.7 Repeat steps 1 through 6 for the other earcup.

8.2 Replacement
8.2.1 Slide the earcup to earcup cable through the hole in the earcup.
8.2.2 Push grommet into place in the earcup.
8.2.3 Pull one end of the cable towards the inside of the earcup to provide enough room to put crimp ring in place.
8.2.4 Place the crimp ring .125 inches (3mm) from end of cable jacket and crimp in place.
8.2.5 Pull cable back through grommet until crimp ring is snug against grommet.
8.2.6 Plug connector at end of earcup to earcup cable assembly into circuit board and seal connection using sealant.
8.2.7 Secure ring tongue terminal in place using cross-tipped screwdriver and torque screw to 2.0 +/- .2 in-lbs. (23 +/- 2 g-m)
8.2.8 Assemble the inner and outer earcups ensuring no wires are pinched. When assembling the inner and outer cup assemblies, be sure to twist the wiring 1 ½ to 2 turns such that the cable fits neatly into the earcup when assembled.
8.2.9 Secure outer earcup in place using three sealing screws. Torque screws to 3.0 +/- .25 in-lbs. (35 +/- 3 g-m)
8.2.10 Repeat steps 1 through 9 for other earcup.
Sealing Screws Securing Outer and Inner Earcups

Figure 8-1

Separating Outer and Inner Cup Assemblies

Close-up of Installed Earcup Cable

Figure 8-2

Crimp Ring

Grommet

Position of Ring Crimp

.125"
Plug Earcup Cable Connector into Circuit Board at J1 and Seal
Connect Ring Tongue Terminal to Screw

Plug Earcup Cable Connector into Circuit Board at J1 and Seal
Connect Ring Tongue Terminal to Screw

Figure 8-3
9 INNER EARCUP REMOVAL AND REPLACEMENT

9.1 Removal

9.1.1 Using a cross-tipped screwdriver, remove the three sealing screws holding outer earcup to the inner cup assembly.

9.1.2 Separate the outer and inner earcup assemblies

CAUTION
THE HEADSET CONTAINS A CIRCUIT BOARD SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD).

9.1.3 Remove all connections to the circuit board. Cut away the sealant over all the connectors at the circuit board prior to removal.

9.1.4 Using a cross-tipped screwdriver, loosen screw holding ring tongue terminals from the earcup cable and vehicle cable to circuit board and remove ring tongue terminal.

9.1.5 Remove the inner cup assembly.

9.2 Replacement

9.2.1 Holding the system microphone wire flat, position the circuit board on the inner earcup.

9.2.2 Using a cross-tipped screwdriver, loosen screw on circuit board to capture the ring tongue terminals from the vehicle and earcup cables under the screw where shown. Torque screw to 2.0 +/- .2 in-lbs. (23 +/- 2 g-m)

9.2.3 Plug all of the connectors into the circuit board and seal connections using sealant.

9.2.4 Assemble the inner and outer earcups ensuring no wires are pinched. When assembling the inner and outer cup assemblies, be sure to twist the wiring 1½ to 2 turns such that the cable fits neatly into the earcup when assembled.

9.2.5 Secure the outer earcup in place using three sealing screws. Torque screws to 3.0 +/- .25 in-lbs. (35 +/- 3 g-m)
Sealing Screws Securing Outer and Inner Earcups

Separating Outer and Inner Cup Assemblies

Assembly Opened to Separate Inner and Outer Earcups

Secure Connection to Circuit Board and Seal Connect Ring Tongue Terminals to Screw