TELEX

AIRMAN 750

en Customer Maintenance Manual

Table of contents

1 General information

1.1 Record of Revisions

Rev No	Revision Date	Change Description
A	12/1988	See previous revisions of 38108-965 for affected changes
B	06/1989	
C	01/1990	
D	11/1993	
E	03/1995	
F	04/1996	
G	06/2000	
7	07/2017	This document was completely rewritten and a Bosch part number (F.01U.311.532) was assigned.
8	09/2017	– Updated revision on front cover – Removed the Insertion Date column from this table – Technical Support Contact information updated – In the models covered table, updated part number type-o
9	08/2018	– Minor formatting and parts list update
10	04/2022	– Update format
11	08/2022	– Corrected a link on page 28.
12	01/2023	– Update Section 6 with new part number for artificial mouth. – Update sensitivity check instructions.
13	03/2023	– Updated Receiver specifications for Frequency Response and Sensitivity (page 8)
14	07/2023	– Updated exploded view drawing to match parts list
15	08/2023	– Removed the Lincoln Nebraska address from the manual

1.2 Purpose of manual

This manual, Bosch part number F.01U.311.532, contains information for the overhaul and servicing of the Airman 750/760 headset.

1.3 Technical support

A liaison between the customer and factory is provided by the Bosch Product Support Department. Consultation and assistance on technical problems, part information, and availability of local and factory repair facilities is available. When writing, include all information concerning problem and mail to:

Bosch Communications, LLC

Email: telexdispatchtechsupport@us.bosch.com

Attn: Aircraft Product Support Mgr.

Telephone: 877-863-4188

1.4 Parts ordering

Replacement parts may be ordered from our parts department. When ordering, please include the following information:

- Model Number
- Part Description
- Part Number
- Quantity

Mail to:

Bosch Communications, LLC

Attn: **Parts department**

Telephone: 800-553-5992
Fax: 402-467-3279
E-mail: repair@us.bosch.com

1.5 Repairs

In order to maintain the FAA certification, all repairs to the headset must be made only by persons authorized under Part 43 of the Federal Aviation Agency regulations. Bosch offers full support and repair.

2 Description and specifications

2.1 General description

The Telex Airman 750 Headset and the Airman 760 Headphone are designed and engineered for high-quality aircraft communications. The Airman 750 is approved for aircraft use under the Federal Aviation Agency TSO C57a and C58a. The Airman 760 is approved for aircraft use under the Federal Aviation Agency TSO C57a.
The Airman 750 Headset features a miniature, noise-canceling electret microphone element which provides superior hum rejection. The microphone is mounted upon a boom which pivots 310 degrees for use on either side of the user's head. The headset amplifier has an adjustable gain control and provides output levels equivalent to carbon microphone levels. Several variations of the 750 headset exist; each model has a different connector and a unique wiring diagram.
The Airman 760 Headphone is designed for users who operate hand-held microphones. The 760 is virtually identical to the 750 headset, without the boom microphone.

2.2 Models covered

Model Number	Description	Connector
Airman 750		
64300-200	Double side headset, 2x PJ, 150 Ω	PJ-068/PJ-055 (or equivalent)
64300-205	Double side headset, 2x A5M, 150 Ω	XLR 5-pin Male
64300-208	Double side headset, 2x A5M, 150 Ω, 7ft	XLR 5-pin Male
64300-210	Double side headset, 2x A5M, 600 Ω	XLR 5-pin Male
64300-212	Double side headset, 2x PJ, 600 Ω	PJ-068/PJ-055 (or equivalent)
64300-218	Double side headset, 2x PJ, 150 Ω, 8ft	PJ-068 (or equivalent)
64300-219	Double side headset, 2x A4F, 150 Ω	XLR 4-pin Female
64300-220	Double side headset, 2x PJ, 150 Ω	PJ-068/PJ-055 (or equivalent)
64300-300	Single side headset, 2x PJ, 300 Ω	PJ-068/PJ-055 (or equivalent)
Airman 760		
64400-200	Double side headphone, PJ, 150 Ω	PJ-055 (or equivalent)

Table 2.1: Airman 750/760 Models and Connector

Notice!
Model 64400-000, -203 and Models 64300-000, -005, -105, -008, -108, -010, -110, -012, -112, -016, -116, -018, -118, -019, -119, -020, -021, -121, -022, -122, -201, -216 are no longer supported and are not covered in this CMM.

2.3 Specifications

Receivers

Type:	Dynamic
Impedance:	150 Ω 64300-200, -205, -208, -218, -219, -220; 64400-200 300 Ω 64300-300 600 Ω 64300-210, -212
Frequency response:	Within ±6 dB relative to the output at 1kHz between 350 Hz to 3000 Hz
Sensitivity:	90 dB SPL ±5 dB at 1 kHz, 1 mW input (when tested with 6cc coupler)

Microphone (Airman 750 only)

Type:	Noise-canceling amplified electret
Matching impedance:	50 to 600 Ω
Frequency response (Airman 750):	300 Hz to 5000 Hz within limits shown below
Sensitivity:	Ref. 1 V/µbar @1 kHz, 12 VDC – 51 +3/-3 dB (all versions except -220) – 44 +2/-1 dB (-220)
Total Harmonic Distortion (THD):	Less than 5% from 350 Hz to 6000 Hz when the microphone is exposed to 114 dB SPL input.
Operating voltage:	8 to 16 VDC (470 Ohm load)

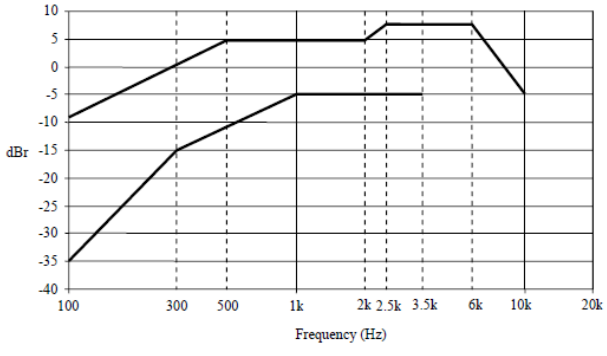

Figure 2.1: Microphone Frequency Response

Approximate gross weight

	Airman 750	Airman 760
Single-sided	4 oz. (113 g)	3 oz. (85 g)

	Airman 750	Airman 760
Double-sided	4.8 oz. (136 g)	

Approximate wearing weight

	Airman 750	Airman 760
Single-sided	2.3 oz. (65 g)	2.2 oz. (62 g)
Double-sided	3.2 oz. (91 g)	

Plug type

Varies by model. Refer to *Models covered, page 7*.

Cord length

Varies by model. Refer to *Disassembly and assembly, page 15*.

3 Parts list

3.1 General

When replacing parts, consult the illustration, *Airman 760, catalog number 64400-200, page 10* and *Airman 750, catalog number 64300-200, -205, -208, -210, -212,-218, -219, -220, and -300, page 11*. Choose the parts corresponding to the catalog/model.

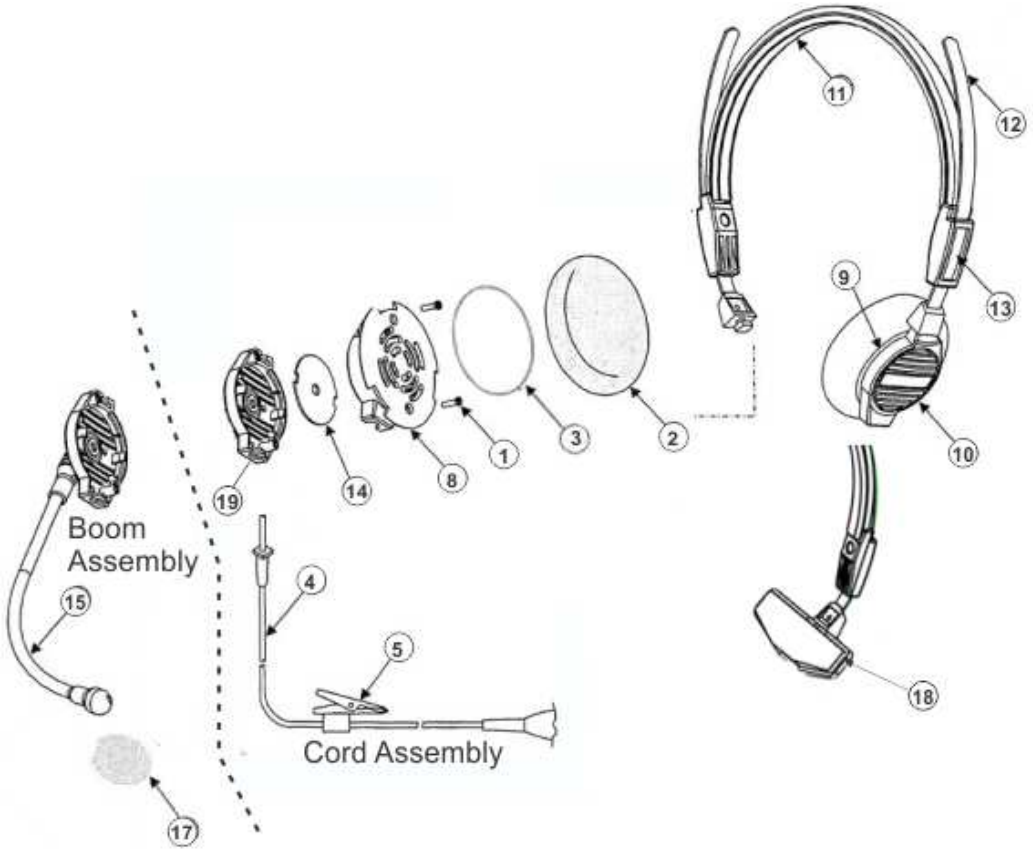

Figure 3.1: Airman 750/760 series-200/300 exploded view

3.2 Airman 760, catalog number 64400-200

Item	Ordering Part Number	Description	Model -200
1	590404360	SCRW PT, PAN HEAD, K15 X 6MM, BLK ZINC	4
2	590402002	EAR CUSHION (1 per pkg.)	2
	800456005 OR 64301000	EAR CUSHION (2 per pkg.)	1
3	701335000	CUSHION PAD	2
4	63988002	CORD LENGTH: 5.5 ± 0.2 ft. (1.68 ± 0.15 m)	1
5	590637000	CLOTHING CLIP	1
8	64308100	HOUSING (Receiver) ASSY PACKAGED, left side	1
9	64308110	HOUSING (Receiver) ASSY PACKAGED, right	1

Item	Ordering Part Number	Description	Model -200
10	64404018	HOUSING REAR, right side no printing	1
	800504000 OR ESP-F01U323856	HOUSING REAR, right side printing	1
11	S-64318081	HEADBAND ASSEMBLY	1
12	64310000	GLIDER ASSEMBLY	2
13	64305000	GLIDER SPRING	
	S-F01U327240	GLIDER SPRING (10-pack)	2
14	Not Available as a replaceable part	CIRCUIT BOARD	1
15	S-64404024	HOUSING REAR, LEFT SIDE	1

3.3 Airman 750, catalog number 64300-200, -205, -208, -210, -212,-218, -219, -220, and -300

Item	Ordering Part Number	Description	Models								
			200	205	208	210	212	218	219	220	300
1	590404360	SCREW, PT, PAN HEAD, K15 X 6MM, BLK ZINC	4	4	4	4	4	4	4	4	2
2	590402002	EAR CUSHION (1 per pkg.)	2	2	2	2	2	2	2	2	1
	800456005 OR 64301000	EAR CUSHION (2 per pkg.)	1	1	1	1	1	1	1	1	
3	701335000	CUSHION PAD	2	2	2	2	2	2	2	2	1
4	70413002	CORD Approximate Length: 5.5 ft. (1.67 m)	1								1
	63988018	CORD Approximate Length: 5.8 ft. (1.76 m)		1							

Item	Ordering Part Number	Description	Models								
	63988025	CORD Approximate Length: 7 ft. (2.13 m)			1						
	63988031	CORD Approximate Length: 6 ft. (1.82 m)				1					
	70413002	CORD Approximate Length: 5.5 ft. (1.67 m)					1				
	63988043	CORD Approximate Length: 8 ft. (2.4 m)						1			
	S-F01U327247	CORD							1		
	70413006	CORD Approximate Length: 5.5 ft. (1.67 m)								1	
5	590637000	CLOTHING CLIP	1	1	2	1	1	1	1	1	1
8	64308100	HOUSING (Receiver) ASSY PACKAGED, left side		1	1				1		
	64308108	HOUSING (Receiver) ASSY PACKAGED, left side				1					
	64308115	HOUSING (Receiver) ASSY PACKAGED, left side	1					1		1	1

Item	Ordering Part Number	Description	Models								
	64308117	HOUSING (Receiver) ASSY PACKAGED, left side					1				
9	64308110	HOUSING (Receiver) ASSY PACKAGED, right side	1	1	1	1	1	1	1	1	
10	64404018	HOUSING REAR, right side	1	1	1	1	1	1	1	1	
	ESP-F01U323856	HOUSING REAR, right side (printed)									
11	64318069	HEADBAND ASSEMBLY	1								
	64318070	HEADBAND ASSEMBLY		1							
	63993010	HEADBAND ASSEMBLY			1						
	64318071	HEADBAND ASSEMBLY				1					
	S-64318072	HEADBAND ASSEMBLY					1				
	64318074	HEADBAND ASSEMBLY						1			
	S-F01U327241	HEADBAND ASSEMBLY							1		
	S-64318075	HEADBAND ASSEMBLY								1	
	64318085	HEADBAND ASSEMBLY									1
12	64310000	GLIDER ASSEMBLY	2	2	2	2	2	2	2	2	1
13	64305000	GLIDER SPRING 1-piece	2	2	2	2	2	2	2	2	2

Item	Ordering Part Number	Description	Models								
	S-F01U327240	GLIDER SPRING 10-piece									
14	ESP-F01U402346	PCBA	1	1	1	1	1	1	1	1	1
15	64307008	BOOM ASSEMBLY		1	1	1			1		
	64307013	BOOM ASSEMBLY	1				1	1		1	1
16	59688000	WINDSCREEN	1	1	1	1	1	1	1	1	1
	800456001	WINDSCREEN + O-RING	1	1	1	1	1	1	1	1	1
17 [a]	580001003	OPTIONAL O-RING	1	1	1	1	1	1	1	1	1
18	70531004	TEMPLE PLATE									1
20	70533000	TEMPLE PLATE FOAM PAD									1
21 [b]	701246000	BOOM ROTATOR CAP	1	1	1	1	1	1	1	1	1
22	S-F01U322242	OVERHEAD CORD	1	1	1	1	1	1	1	1	1

[a]Windscreen (59688000) is standard equipment. Optionally, windscreen + o-ring (800456001) can be used.

[b]Not shown. Included as part of item 15 (Boom Assembly) or can be purchased separately.

4 Disassembly and assembly

The following procedure allows for complete disassembly of the Airman 750 and Airman 760. Refer to the illustration and to *Parts list, page 10*.

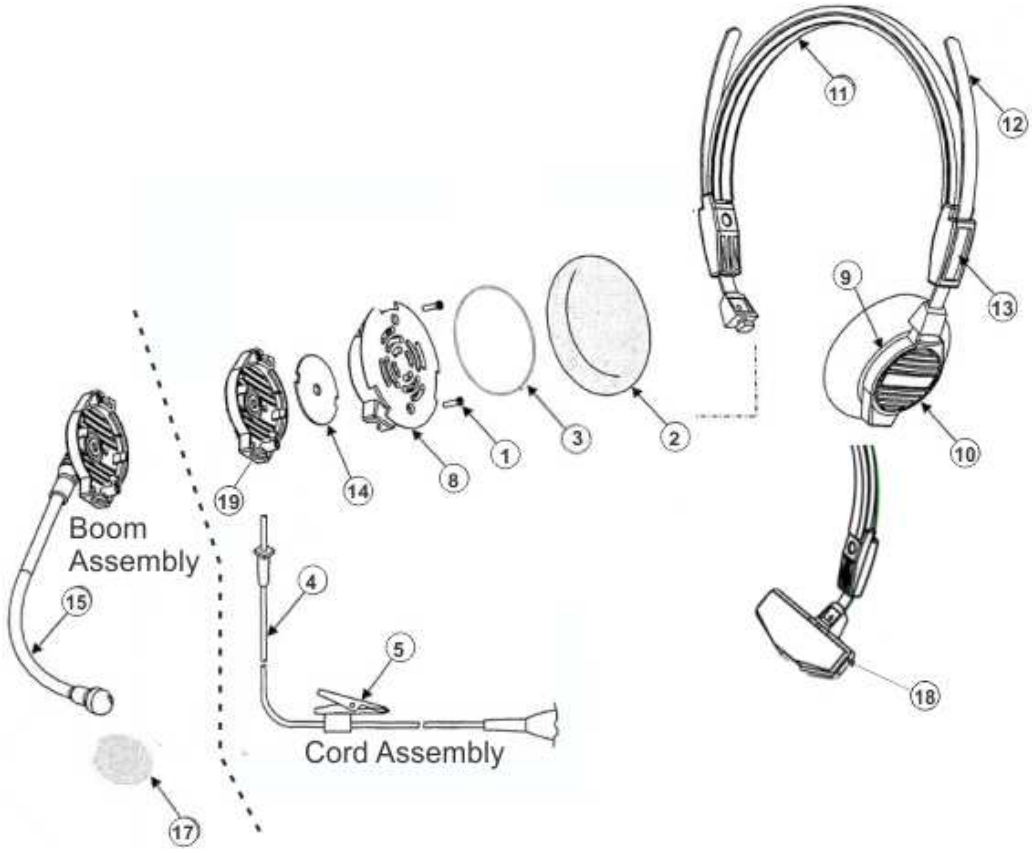

Figure 4.1: Airman 750/760 series-200/300 exploded view

Notice!
Assembly is the reversal of the disassembly procedure. Please take care when disassembling to note details that may be required in the assembly process, such as the locations of disconnected wires.
When soldering, be careful not to touch the plastic housing of the headset/headphone with the soldering iron.

4.1 Disassembly

4.1.1 Removal of the receiver assembly

To **remove the receiver assembly**, do the following:

1. Gently remove the **foam ear cushion (2)** (and ear cushion pad if present).
2. Using a Torx-5 screwdriver, remove the **two screws (1)** from the receiver assembly (8, 9). The rear housing separates from the receiver assembly and the headband.

Notice!
Do not pull the receiver assembly more than 12 mm away from the rear housing at this time.

3. For the cord side, using a soldering iron, carefully disconnect the **red and white internal wires** from either the circuit board or the receiver assembly.
   OR
   For the non-cord side, continue to the **next step**.
4. Using a soldering iron, carefully disconnect the **overhead cord wires** from the receiver assembly.

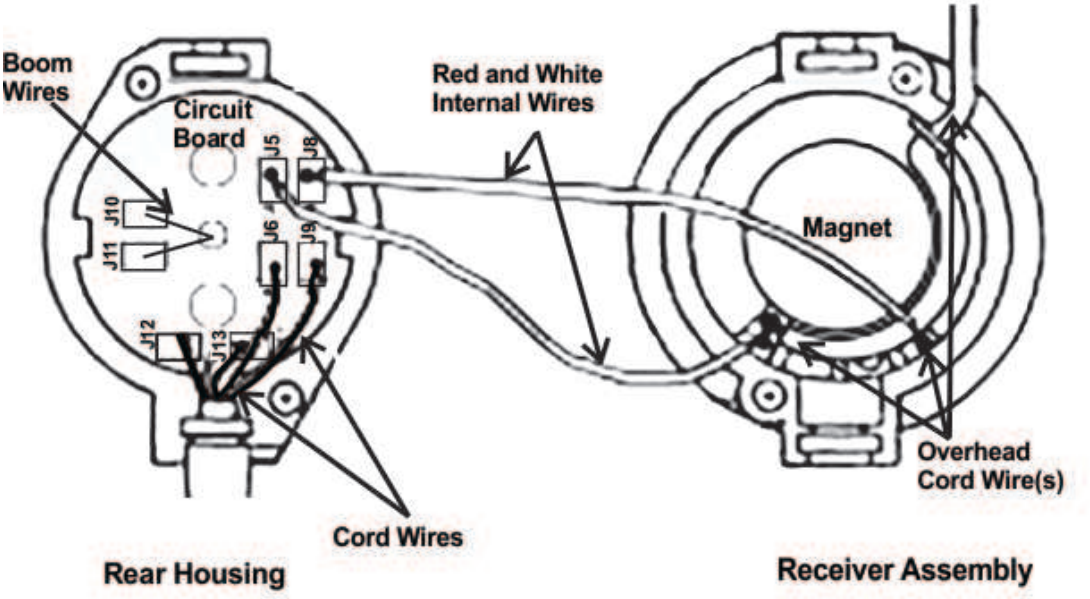

Figure 4.2: Circuit board / Receiver / Cord Wiring

Notice!
Airman 750 model -300 does not have overhead cord wires.

4.1.2 Removal of the cord assembly

To **remove the cord assembly**, do the following:

1. Gently remove the **foam ear cushion (2)** (and ear cushion pad if present).
2. Using a Torx-5 screwdriver, remove the **two screws (1)** from the receiver assembly (8, 9).
   The rear housing separates from the receiver assembly and the headband.

Notice!
Do not pull the receiver assembly more than 12 mm away from the rear housing at this time.

3. For the cord side, using a soldering iron, carefully disconnect the **red and white internal wires** from either the circuit board or the receiver assembly.
   OR
   For the non-cord side, continue to the **next step**.
4. Using a soldering iron, on the circuit board carefully disconnect the **four wires from the cord assembly (4).**

4.1.3 Removal of the circuit board and boom assembly (Airman 750)

To **remove the circuit board**, do the following:

1. Follow **steps 1 to 2 in the procedure for removing the cord assembly**.
   Refer to *Removal of the cord assembly, page 16*.
2. If disassembling an Airman 750, use a soldering iron on the circuit board to carefully disconnect the **two boom wires from J10 and J11**.
   OR
   If disassembling an Airman 760, continue to **next step**.
3. Pull back **the black clasps on the side of the circuit board** to release it for removal.
   The 750 boom assembly is now free of all headset components.

Notice!
Appearances vary slightly for some versions. Refer to *Parts list, page 10* for part number descriptions and ordering number.

4.1.4 Removal of a glider

To **remove a glider from the headset**, do the following:

1. Using a pair of needle nose pliers, straighten the crimp at the end of the glider.
2. Once the crimp is straightened, gently slide the slider through the glider stabilizer.

Notice!
Take care not to lose the glider spring (a small curved rectangular piece of plastic). The glider spring provides tension to hold the glider in place when mounted in the headset. The outward facing arc should be touching the glider providing some tension.

3. Repeat steps 1 and 2 for dual-sided headset models.

For a complete list of wiring diagram information, refer to *Wiring and connectors, page 18*.

4.2 Assembly

Notice!
Assembly is a reversal of the disassembly procedure. Steps need to be done exactly the reverse order of the disassembly procedure to ensure proper headset fit and operation. Please take care to properly align parts and wires to ensure proper operation. See disassembly procedure, parts lists, assembly diagrams, and wiring diagrams for reference.

Notice!
Speaker wires and overhead cord must be routed around the perimeter of the magnet in the receiver assembly to ensure they do not get pinched between the circuit board and the speaker.

5 Wiring and connectors

5.1 Airman 750 wiring diagrams

Notice!
On the speaker, the positive terminal is usually indicated with a dot.

5.1.1 Catalog numbers 64300 -200, -220, -300

Notice!
With model -300 omit overhead cordage.

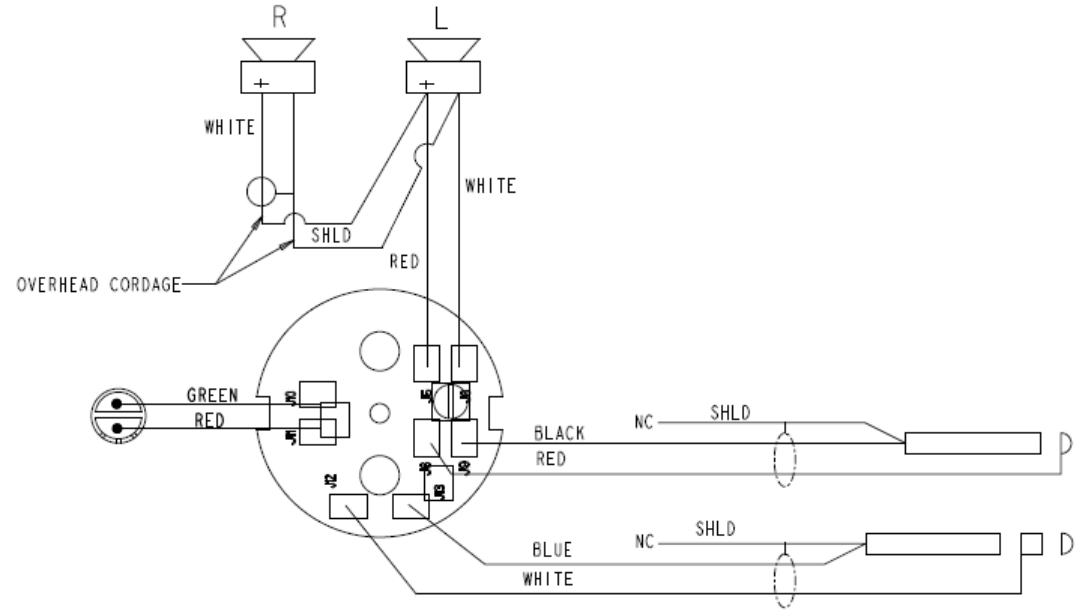

Figure 5.1: Airman 750 Headset Model -200, -220, -300 Wiring Diagram

5.1.2 Catalog number 64300 -210

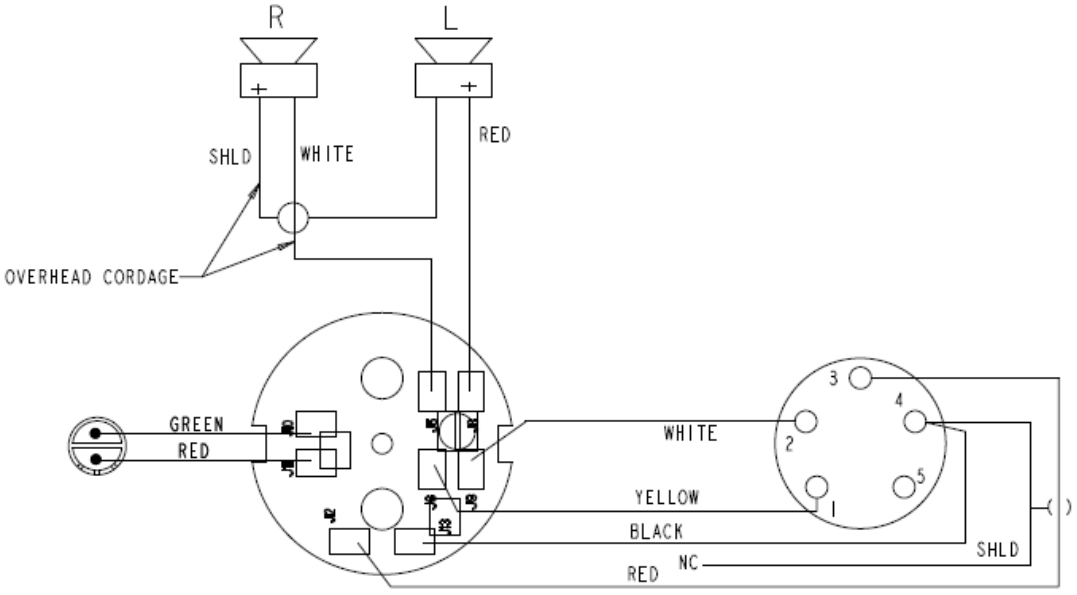

Figure 5.2: Airman 750 Headset Model -210 Wiring Diagram

5.1.3 Catalog numbers 64300 -205, -208

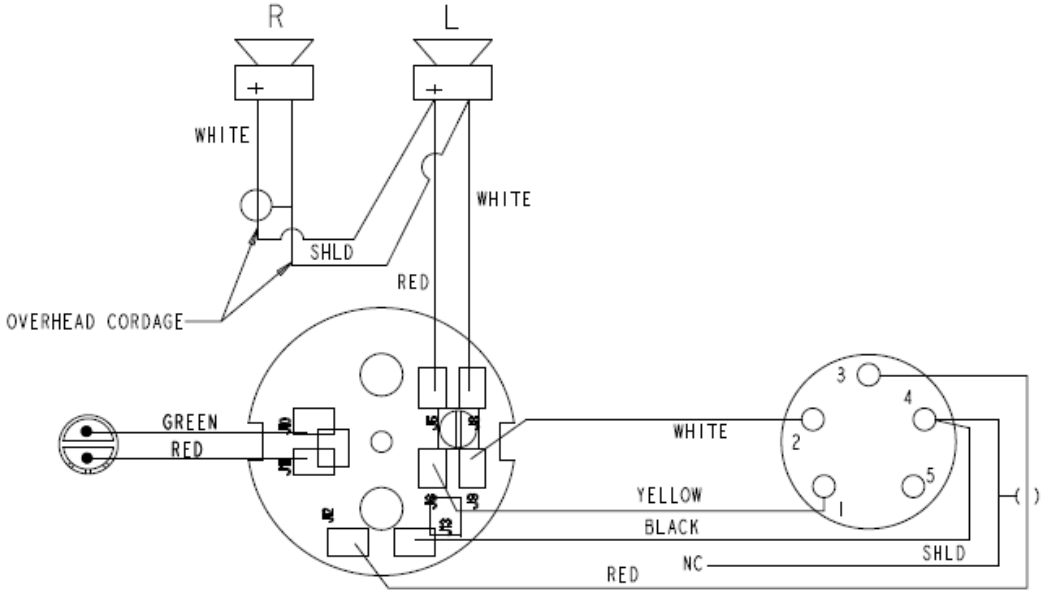

Figure 5.3: Airman 750 Headset Model -205, -208 Wiring Diagram

5.1.4 Catalog number 64300 -212

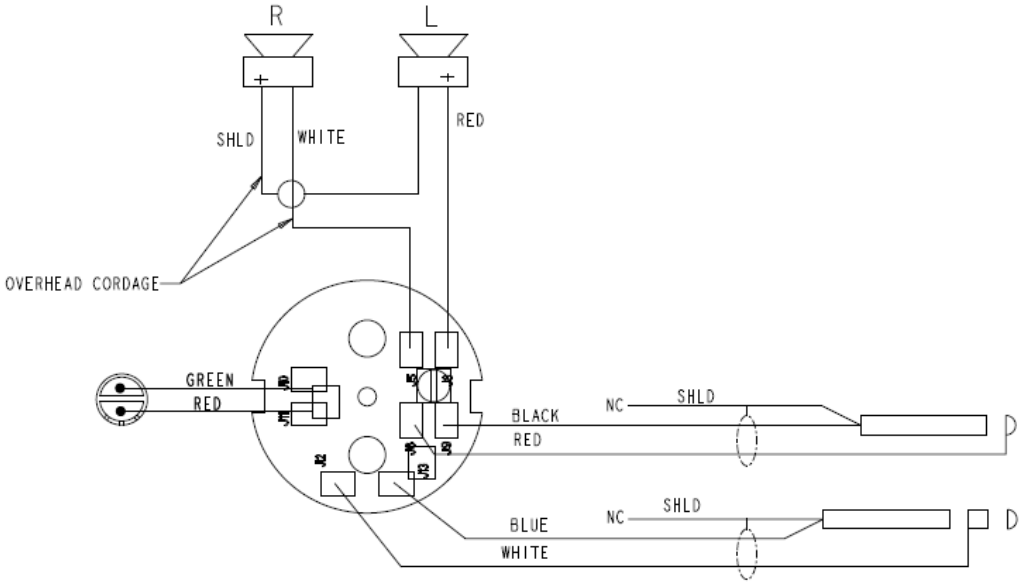

Figure 5.4: Airman 750 Headset Model -212 Wiring Diagram

5.1.5 Catalog number 64300 -218

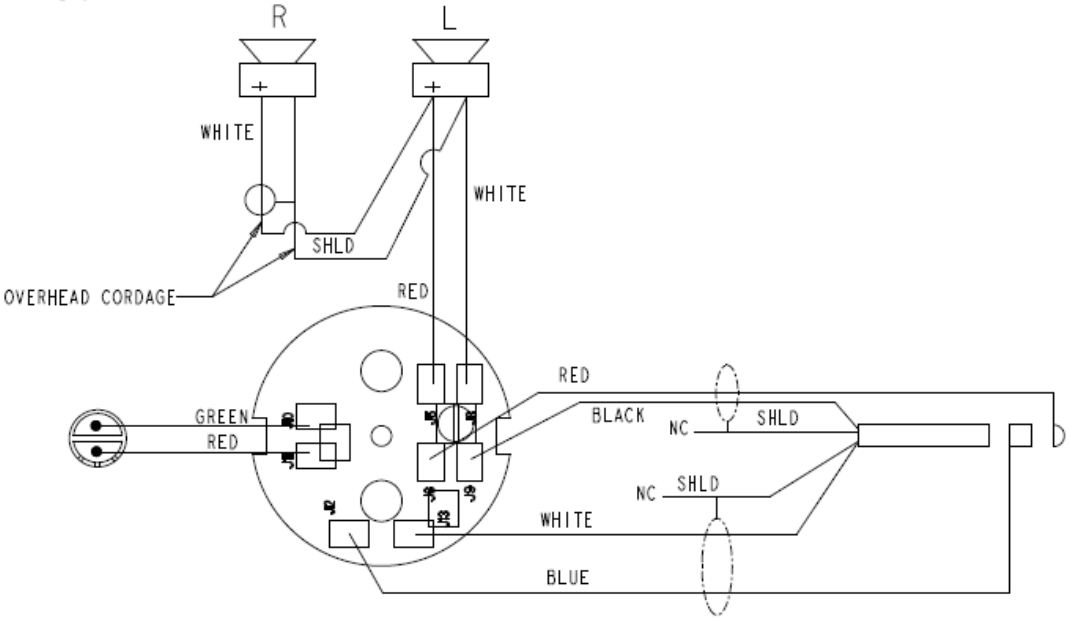

Figure 5.5: Airman 750 Headset Model -218 Wiring Diagram

5.1.6 Catalog number 64300 -219

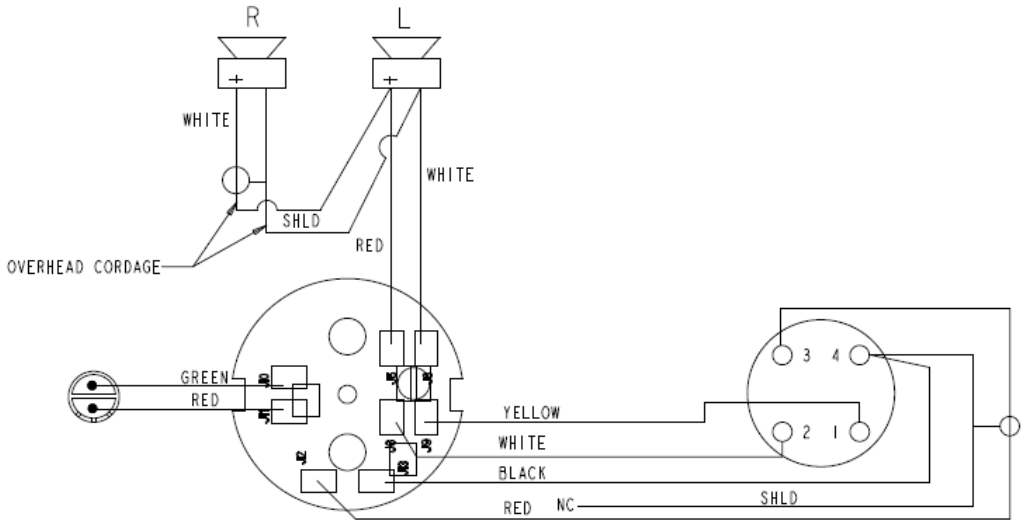

Figure 5.6: Airman 750 Headset Model -219 Wiring Diagram

5.2 Airman 760 wiring diagrams

5.2.1 Catalog number 64300 -200

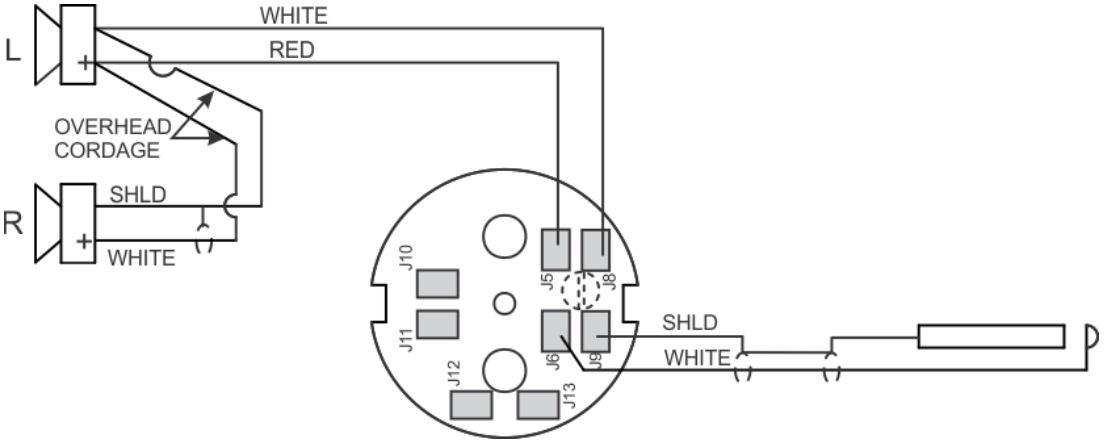

Figure 5.7: Airman 760 Headphone Model -200 Wiring Diagram

5.3 Airman 750 connectors

5.3.1 Connector view for catalog numbers 64300-200, -212, -300

Microphone: .206 in (5.2 mm) DIA.

Receiver: .250 in (6.4 mm) DIA.

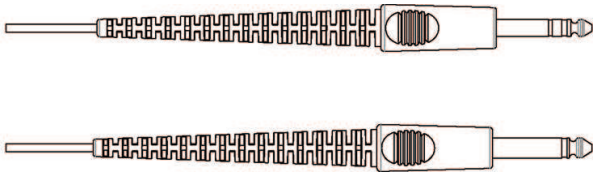

Figure 5.8: PJ068 and PJ055 Connector, 750 Model -200, -212, -300

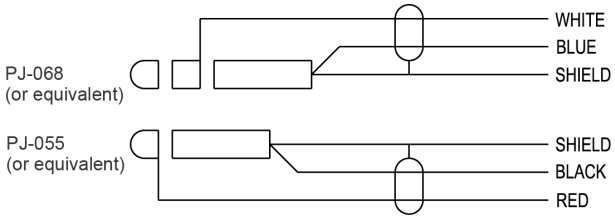

Figure 5.9: PJ068 and PJ055 Connector Wiring, 750 Model -200, -212, -300

5.3.2 Connector view for catalog numbers 64300-205, -208, -210

XLR connector: Neutrik 5MC or equivalent

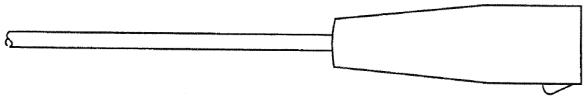

Figure 5.10: XLR Connector, 750 Model -205, -208, -210

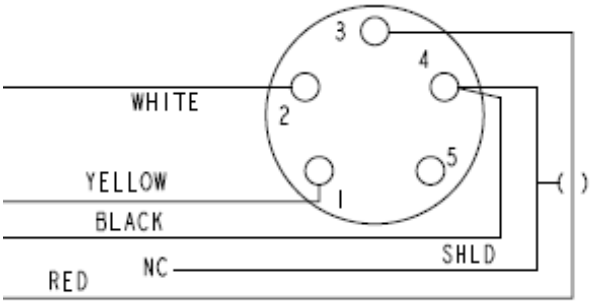

Figure 5.11: XLR Connector Wiring, 750 Model -205, -208, -210

5.3.3 Connector view for catalog number 64300-218

PJ-068: .206 in (5.2 mm) DIA.

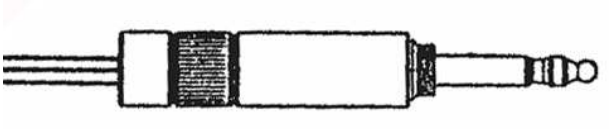

Figure 5.12: PJ-068 Connector, 750 Model -218

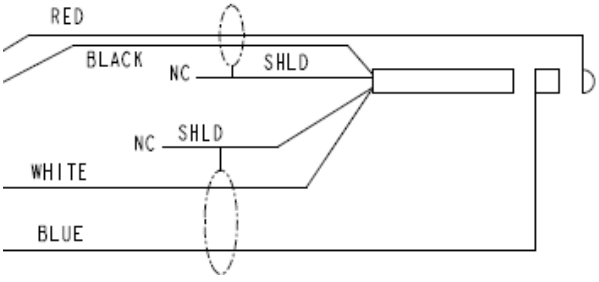

Figure 5.13: PJ-068 Connector Wiring, 750 Model -218

5.3.4 Connector wiring diagram for catalog number 64300-219

XLR connector: Neutrik NC4FX or equivalent

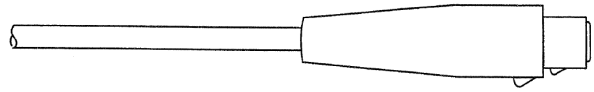

Figure 5.14: XLR Connector, 750 Model -219

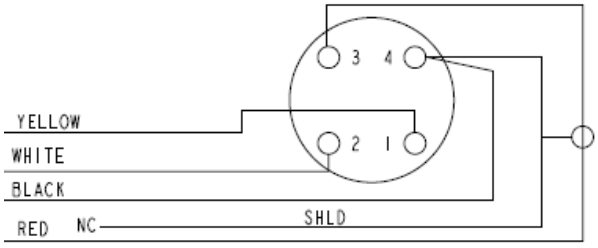

Figure 5.15: XLR Connector Wiring, 750 Model -219

5.3.5 Connector wiring diagram for catalog number 64300-220

Microphone: .206 in (5.2 mm) DIA. right angle

Receiver: .250 in (6.4 mm) DIA. right angle

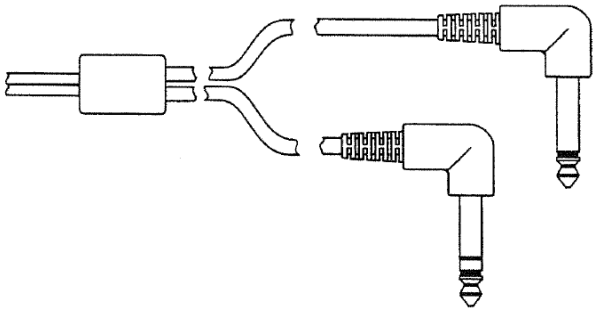

Figure 5.16: PJ068 and PJ055 Connector, 750 Model -220

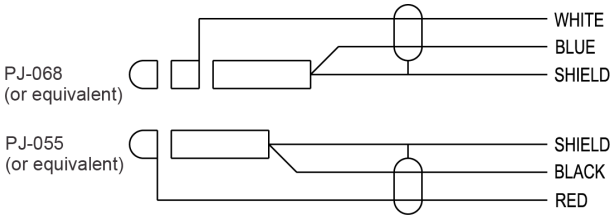

Figure 5.17: PJ055 and PJ068 Connector Wiring, 750 Model -220

5.4 Airman 760 connectors

5.4.1 Connector view for catalog number 64400-200

PJ-055: .25 in (6.4 mm) DIA.

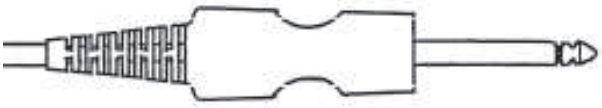

Figure 5.18: PJ-055 Connector, 460 Model -200

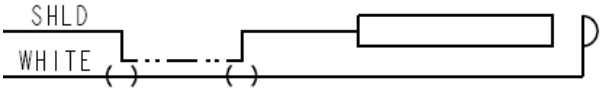

Figure 5.19: PJ-055 Connector Wiring, 760 Model -200

6 Maintenance

6.1 Microphone validation and adjustment

6.1.1 Microphone and amplifier sensitivity check

Headset specifications are designed to comply with FAA TSO C-57a, C-58a, including RCTA DO-170 and DO-160D.

To **test the sensitivity of the microphone**, do the following:

1. Construct a **test circuit**. For more information, see Figure 1.
2. Connect the **test circuit** to the microphone plug of the headset.
   For more information, refer to *Models covered, page 7*.

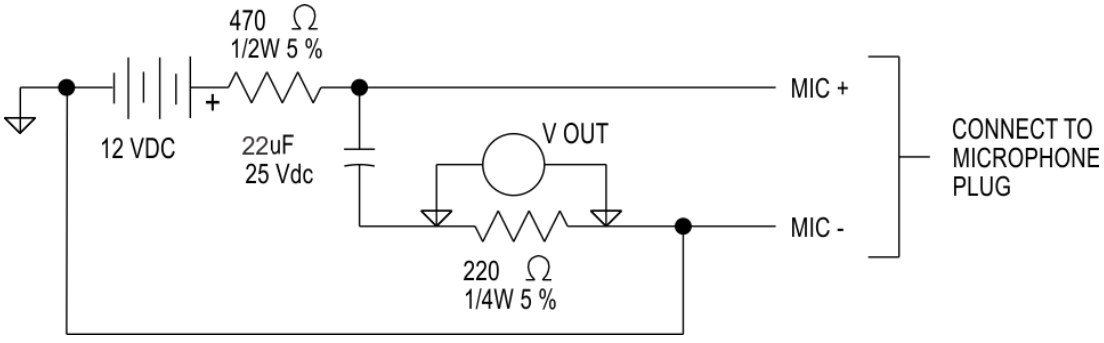

Figure 6.1: Airman 750 Headset Boom Microphone Sensitivity Check Test Circuit

3. Calibrate a **lab microphone**.
4. Place the **calibrated lab microphone** 6 mm above an artificial mouth (Bruel and Kjaer type 4227 or equivalent).
5. Connect a **signal generator** to the artificial mouth.
6. Adjust for an **output of 100 dBspl** or **of 114 dBspl** @ 6 mm from the opening to the lab microphone.
7. Remove the **lab microphone**.
8. Position the **headset boom microphone** 6 mm above the output of the artificial mouth.

Notice!
The acoustic hole in the boom mic should be aligned with the center of the artificial mouth opening. Windscreens should be removed for this test.

9. Measure the **output of the headset microphone** with a digital voltmeter.

	Artificial mouth output	Microphone sensitivity specification
All versions except -220:	@100 dB	63 mVrms +16/-7 mVrms
	@114 dB	316 mVrms +82/-34 mVrms
For -220 use:	@100 dB	126 mVrms +33/-14 mVrms
	@114 dB	631 mVrms +163/-169 mVrms

Table 6.2: Microphone sensitivity specifications

6.1.2 Microphone sensitivity adjustment

Microphone sensitivity is adjusted by turning the gain adjustment control, using a small screwdriver through the opening in the left outer housing assembly. The screwdriver connects with the gain adjustment potentiometer (R11) on the circuit board. Clockwise adjustment increases output level.

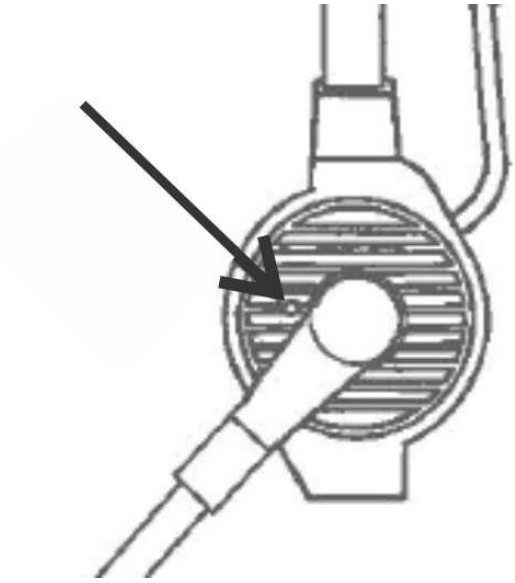

Figure 6.2: Gain Adjustment Control

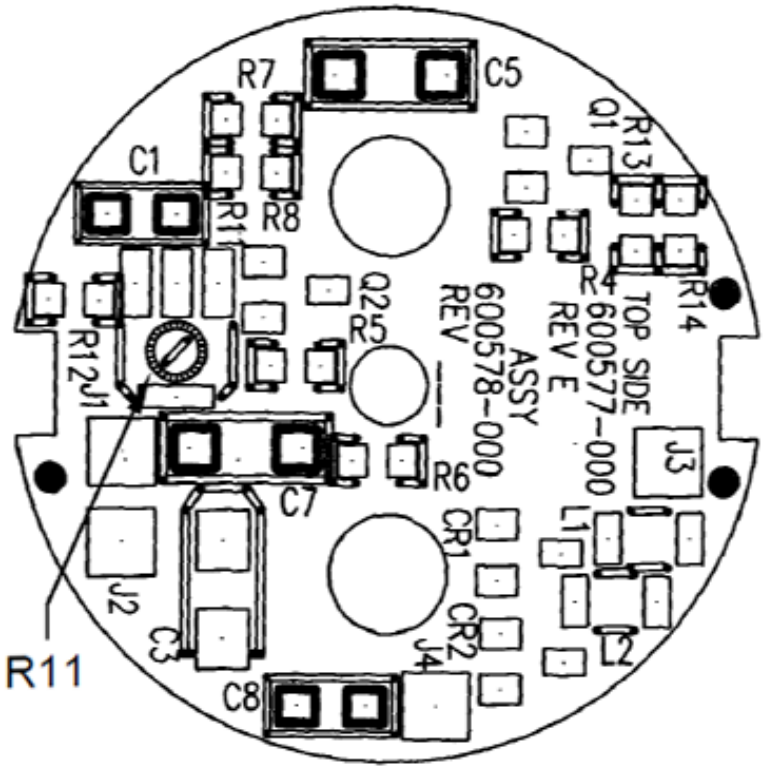

Figure 6.3: Gain Adjustment Potentiometer (R11)

Final sensitivity at 1 kHz shall be set with gain adjust potentiometer R11. Refer to *Microphone and amplifier sensitivity check, page 25*.

6.1.3 Microphone total harmonic distortion (THD) test

1. Calibrate the sound pressure to be 114 dB SPL at 6 mm from an artificial mouth.
2. Measure the THD of the microphone placed at that location using the same test circuit. It meets the TSO spec when THD is less than 5% from 350 Hz to 6000 Hz.

6.2 Circuit board - 200/300 Series Airman 750

The same circuit board is used in all 200 and 300 Series versions of the Airman 750 Headset. Circuit boards may be tested while outside of the headset chassis using the following test circuit:

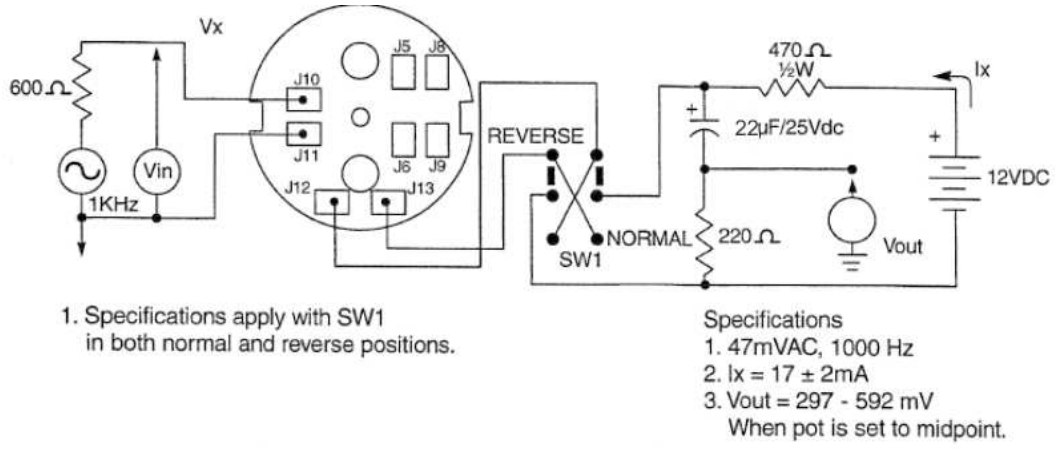

Figure 6.4: Test circuit for Airman 750

6.2.1 Testing the circuit board assembly

To **test the circuit board assembly**, do the following:

1. Construct the test circuit.
2. Connect the **circuit board** to the test circuit.
3. Remove the circuit board and wiring completely from the headset.
4. Set Vin to measure 47 mVAC, 1Khz, VOUT should read 297-592 mV, when pot is set to midpoint.
   If the output is outside this range, replace the circuit board. Specifications apply with SW1 in both normal and reverse positions.

6.3 Speaker validation

6.3.1 Speaker sensitivity and frequency response verification

Transducer type	Dynamic
Sensitivity	(All Models) 104 dB SPL ±5 dB at 1 kHz, 1 mW input to headset, when tested with the flat plate coupler showing in Figure 6.5. 1 mW based on input impedance of headset being tested.
Frequency response	Must meet standards outlined in the specifications.

Earphone testing for the Airman 750 and 760 is done on a flat plate coupler.

To **measure the speaker**, do the following:

1. Calibrate a **lab microphone**.
2. Connect an **audio analyzer** to the lab microphone.
3. Place the **calibrated lab microphone** under the flat plate coupler and up through the hole, flush to the microphone positioning flange.

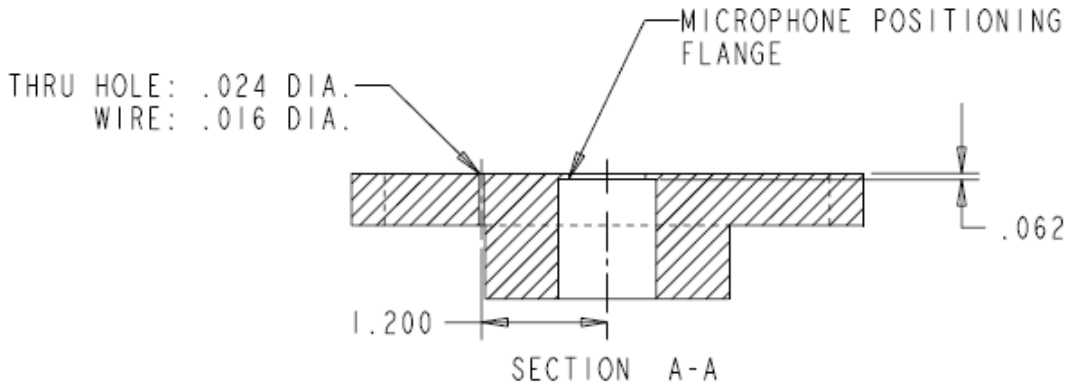

Figure 6.5: Flat Plate Coupler

4. Place the **speaker (without the foam ear cushion or pad)** flush to the top of the flat plate coupler, centered over the hole.
5. Use a **constant voltage sine wave generator** with a 50 Ω output impedance to supply the speaker with a 1 mW, 1 KHz signal to the appropriate connector. For more information, refer to *Models covered, page 7*.

Notice!
Once the headset/headphone is connected to the constant voltage sine wave generator, the output voltage can be measured by the audio analyzer connected to the lab microphone.

6. Adjust the **voltage across the headset** per the following table.

VERSION	VOLTAGE ACROSS HEADSET PLUG	SPEAKER WIRING	IMPEDANCE
64300-200, -205, -208, -218, -219, -220 64400-200	.39 VRMS	Parallel	150 Ω
64300-300	.39 VRMS	Stereo	300 Ω
64300-210, -212	.77 VRMS	Series	600 Ω

Table 6.3: Headset/headphone voltage, speaker wiring, and impedance

7. Measure the **acoustic output of the headset**, using the audio analyzer.

Notice!
Earphone sensitivity @1 kHz should be 104 ±5 dB on the earphone.

8. Measure and record the **acoustic output over the frequency range of 350 Hz to 3 KHz.**

Notice!
The resultant curve should meet the limits as defined in *Specifications, page 8*.

9. Repeat steps 1 through 8 with the second speaker, if applicable.

7 Troubleshooting

7.1 Troubleshooting chart

	Check plug(s)	Check amplifier	Check cord	Check boom mic assembly and internal wiring	Check speaker(s) and internal wiring	Check amplifier gain adjust
Receiver inoperative	X		X		X	
Microphone inoperative	X	X	X	X		
Receiver intermittent	X		X		X	
Microphone intermittent	X	X	X	X		
Distorted receiver signal					X	
Distorted microphone signal		X		X		X
Microphone level cannot be adjusted properly		X		X		X

Bosch Security Systems, LLC
130 Perinton Parkway
Fairport, NY 14450
USA
www.telex.com

EU importer:
Bosch Sicherheitssysteme GmbH
Robert-Bosch-Platz 1
70839 Gerlingen
Germany

202308152041