

As with any complex electronic device, it is possible for this headset to experience a failure during operation. Such a failure may include loud tones, distortion and loss of communications signal in the headset when used in the active or "on" position. The system is "on" when the rocker switch is "up".

Note: This failure could prevent continued use of the headset in the "on" position.

These loud tones and the related loss of communications can be eliminated for the duration of the flight simply by switching the headset off. (The system is off when the rocker switch is "down.") With the switch off, the headset continues to function in the passive mode, maintaining full communication capabilities.

We strongly recommend that as a responsible pilot, you ensure you can hear and recognize typical aircraft sounds while you are using the headset. Limit the volume of your headset to safe levels so it does not interfere with your ability to hear informational sounds, such as those emitted by warning alarms; i.e., stall warning, gear up.

Avoid setting the volume controls at high levels that may affect your hearing during extended periods of headset use.

The Bose[®] Aviation Headset Series II has been tested and found to comply with limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- · Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

This apparatus does not exceed the class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications. It also complies with Canadian ICES-003 Class B. This headset meets or exceeds all requirements of EN352-4, 1996 (European Standard-Hearing Protectors-Safety Requirements and Testing-Part 4: Level-Dependent Ear Muffs).

- The wearer should ensure that:
 - i. The ear muffs are fitted, adjusted, and maintained in accordance with the manufacturer's instructions.
 - ii. The ear muffs are worn at all times in noisy surroundings.
 - iii. The ear muffs are regularly inspected for serviceability.
- WARNING: If the above recommendations are not adhered to, the protection afforded by the ear muffs will be severely impaired.
 - This product may be adversely affected by certain chemical substances. Further information can be sought from the manufacturer.
 - Ear muffs, and in particular cushions, may deteriorate with use and should be examined at frequent intervals for cracking and punctures, for example.

EN352-4 also calls for HML Criterion Levels and other data to be provided to describe the hearing protection performance of leveldependent devices. At present, no standard has been drafted or accepted defining how to measure the hearing protection provided by active noise cancelling headphones. In the absence of an accepted method, Bose[®] Corporation has had the product's attenuation measured by an accredited U.S. testing laboratory using a combination of real head methods. Based on this information, the Bose Aviation Headset Series II provides sufficient hearing protection in any noise up to 108 dB(A) in sound pressure level. For more information on the methods used and the results obtained, please contact the Bose Aviation Headset Service Department (page 23).

This headset complies with RTCA/DO-214 Audio Systems Characteristics and Minimum Operational Performance Standards for Aircraft Audio Systems and Equipment:

- Sustained RF Susceptibility per RTCA/DO-214 ¶ 2.5.11.2 and RTCA/DO-160C ¶ 20.0, Category T.

CE				
Declaration of Conformity				
We	the offerer:			
Bose [®] Corporation, The Mountain, Framingham, MA 01701-9168 USA				
acknowledge our sole	responsibility, that the product:			
Kind of equipment:	leadset			
Type designation:	Bose Aviation Headset Series II			
in accordance with EMC Directive 89/336/EEC and Article 10(1) of the Directive, is in compliance with the following norms:				
Technical regulations: Electromagnetic Compatibility Emis Electromagnetic Compatibility Susc	eptibility EN55011, EN55013, EN55022			
Accredited by Bose Corporation				
14 March 1997	Alan Wallary			
Bose B.V.	Anton Schalkamp			
Nijverheidstraat 8,1135 GE Edam The Netherlands	General Manager, Bose Europe Manufacturer's authorized EU representative			

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Introduction

Description

Congratulations on your purchase of the Bose[®] Aviation Headset Series II. This headset uses an advanced combination of electro-acoustical noise reduction circuitry and a patented cushioning system to significantly reduce aircraft noise. It actively reduces noise elements in addition to muffling noise. The patented Clear Comfort[™] cushions require only slight pressure to provide high passive noise attenuation. As a result, this headset can be worn comfortably for extended periods.

The headset may be powered in one of two ways: a portable battery pack, or a connector installed into your aircraft.

ATTENTION: With the headset's combination of both active and passive attenuation, typical aircraft sounds (for example, those from engines, propellers, warning alarms, and other sound sources) may sound different to you.

We strongly recommend that you ensure you can hear and recognize these sounds while you are using the Bose aviation headset while operating any aircraft.

In addition, should you choose to listen to in-flight entertainment through a Bose headset while piloting, we remind you to limit the volume to safe levels so that it does not interfere with your ability to hear informational sounds, such as those emitted by warning alarms.

Warranty card

- 1. Remove the headband cushion by pulling it away from the hook and loop fastener.
- 2. Copy the serial number from the white label onto the warranty card.
- 3. Complete the warranty card and mail it to Bose.

For proper headset fit

Note: The headset must be worn with the Bose logo (located on the earcups) facing forward.

To achieve comfort and good performance, adjust both sides of the headband equally to provide a comfortable fit. To achieve a good seal, lightly grasp both earcups and position them so that your ears are completely inside the Clear Comfort[™] cushions.



Note: If you hear a hiss or a low rumbling sound, this may indicate an improper fit. Extending the headband slightly should correct this condition. Wearing glasses with thick temples or a hat may interfere with the fit and cause a problem.

Final adjustment is best accomplished in a noisy environment with the headset system turned on. Then, reposition both earcups until the headset seems quietest.

Interconnect plug

The headset interconnect plug connects the headset cable to a power source. The power source can be an installed connector in the aircraft's control panel or an adapter cable connected to a portable battery pack. The interconnect plug is designed for quick connection and removal. To ensure correct pin alignment, the plug has a keyway.

Note: The illustrations below show the insertion of the headset interconnect plug into the adapter cable. To insert the interconnect plug into the aircraft control panel, the same procedure would be used.

To insert: rotate the plug until the keyway is aligned; then insert until it locks in place.



To remove: gently pull back on the sleeve of the connector. This automatically unlocks the plug from the socket.



Microphone placement

For good communication clarity and noise rejection, locate the microphone housing so that it just brushes your lips.



Placing the microphone



Figure 3

Figure 2

the keyway

Inserting the headset interconnect plug into

Pulling back on the sleeve to remove the interconnect plug

Adjusting the volume

The volume for your headset is controlled by the grooved knobs located on the front side of the headband arms.

Avoid setting your volume controls at high levels that may affect your hearing during extended periods of headset use.

- Note: The volume controls and the active noise reducing circuitry work only when the headset is turned on (Figure 6).
- Note: The volume cannot be turned off completely.

Figure 5

Adjusting the volume





Figure 6

Turning the headset ON/OFF



Fail-resistant operation

The headset provides communication and the earcups block some noise even with the power switch on your headset turned off, bypassing all active noise reducing electronics. Turn the headset off if you suspect there may be a problem; for more information, refer to "In Case of Difficulty" (page 20).

Microphone boom relocation

To suit your flying preference, the headset boom can easily be moved from one earcup to the other.

- 1. Unscrew the retaining knob on the boom mic mount.
- 2. Unplug the mic cable from the headband arm.



- 3. Find the crescent-shaped flanges on the top and bottom of the boom's attachment clip (Figure 8). The clip fits snugly on the earcup when the flanges face the earcup's outer side. Make sure the arc of the boom curves in front of the headset. Attach the clip to the headset by tightening the attachment knob until the clip is secure.
- ♪ Note: The view shown is for the left earcup. To install on the right earcup, turn the clip-and-boom assembly over.



Figure 7

Unplugging the mic cable

Figure 8

boom

4. Plug the mic cable into the headband arm.

You may want to use the adjustment screw to tighten the tension of the clip on the boom mic. The adjustment screw is on the flat end of the clip. Use a $\frac{3}{32}$ in. hex wrench to tighten it. Do not over-tighten.

Experience in using the headset helps establish your sense of how it should sound. If you notice a problem, refer to "In Case of Difficulty" (page 20). If problems persist, contact the Bose Aviation Headset Service Department to arrange for service (page 23).

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Headset cable relocation

Using the Bose[®] Aviation Headset

Powering the headset

The Bose Aviation Headset Series II may be powered in one of two ways: a portable battery pack, or a connector installed into the aircraft's instrument panel.

Portable battery pack

The portable battery pack is available in two versions: NICAD rechargeable and alkaline.

The NICAD rechargeable battery pack:

- Operates for 12-16 hours
- Recharges in 90 minutes (maximum)
- ▲ **CAUTION**: Be sure to use the correct charger (Bose model numbers BC-QC120 for 120V or BC-QC230 for 230V). Using the wrong charger may damage your charger or battery pack.

The alkaline battery pack:

- Operates for approximately 40 hours
- Holds 6 AA alkaline batteries



Charging the NICAD battery pack

Note: Completion of the charging cycle is indicated by the flashing light on the charger. The battery will not be damaged if left connected to the charger.

Inserting batteries into the alkaline battery pack











Installed connector

An optional installed connector is available for pilots who want to hardwire the DC power, incoming audio, and outgoing microphone functions permanently into their plane. The panel mount receptacle comes wired with a 6 foot harness to simplify the installation process. To order this connector, contact the Bose Aviation Headset Service Department (page 23).

The Bose Aviation Headset Series II uses a self-latching, precision designed quick connector. A mechanical keying system ensures greater ease in mating.

Installing the wire harness

Note: This installation must be done by mechanics qualified to perform this type of avionics installation for the aircraft in which the installed connector will be used.

A .5 in. x .56 in. (1.27 cm x 1.42 cm) cutout is required to mount the connector as shown in Figure 9. There are 6 wires to connect: 2 for microphone, 2 for audio, 1 for power, and 1 for ground. The audio and microphone wires should be connected to the back of the existing microphone and phone jacks. This leaves the existing jacks intact for use with conventional headsets and is usually the fastest installation method.

The pinout for the optional installed connector is as follows:

Pin	Wire	Description
1	Red	Headset power (7-32 Volts DC). Use a .5 amp fuse or circuit breaker.
2	Black	System ground. Connect to the existing audio ground.
3	White	Phone communication-left.
4	Black	Phone communication-right.
5	White	Mic/Hi-audio. Connect to the existing portion of the mic jack that corresponds to the ring position of a headset micro- phone plug. Do not connect to the tip (PTT) segment.
6	White/Blue	Mic/Lo-ground. Connect to the existing portion of the mic jack that corresponds to the barrel position of a headset microphone plug.

Notes:

- 1. If used with a stereo intercom, connect the left and right channels to their respective positions. For mono operation, connect Pins 3 & 4 together to the tip portion of the existing phone jack.
- 2. Do not bend or use excessive force on the installed connector. Doing so may damage or break the internal solder joints.
- 3. If the boom mic works on radio transmit but not through the intercom, check Pin 6. It is probably miswired to the PTT segment of the mic jack.
- 4. The wire connecting Pins 3 & 4 and 5 & 6 are shielded, twisted pair with a shield termination exiting with a black wire for each pair. Connect shields to existing audio wiring shields, or audio ground if the existing wiring is not shielded.

Using the Bose[®] Aviation Headset

5. Approved adhesives for use with this connector are Ciba-Geigy Uralane 5754-A/B, Lord 710, or VTCS-6 Vibratite. Do not let any cyanoacrylate-based adhesives (e.g., Loctite), flux remover, or other caustic compounds come into contact with the installed connector body. These chemicals will cause deterioration and/or irreparable damage to the connector. For information on chemical compatibility and connector part number, contact LEMO USA, Santa Rosa, CA at 1-800-444-5366.

PANEL HOLE REQUIRED



RECEPTACLE - PINOUT (FRONT VIEW)



AIRCRAFT INTERFACE SCHEMATIC



Figure 9

Connector technical information

Installed DC power connector

An optional installed connector is available for pilots who want to use their plane's DC power, instead of the battery pack, with the portable adapter cable. The connector's small size allows it to be installed in a convenient location in the control panel, for example, near the headphone and mic jacks.

Installing the DC power connector

- Note: This installation must be done by mechanics qualified to perform this type of avionics installation for the aircraft in which the installed connector will be used.
 - 1. Install the wires from the DC power connector into the plane.

The pinout for the connector is as follows:

Pin	Wire	Description
1	Red	Headset power (7-32 Volts DC). Use a .5 amp fuse or circuit breaker.
2	Black	System ground. Connect to the existing audio ground.

2. Plug the headset adapter power plug into the connector.



Inserting headset plug into the connector



3. Insert the headphone and microphone plugs into their receptacles in the aircraft's control panel.



Figure 11

Location of headphone and microphone receptacles in a typical plane's control panel

Cleaning instructions

Clean the headset exterior and cushions by wiping them with a moist cloth. Mild soap may be used.

A CAUTION: Do not immerse the headset in water.

The headband cover is made from leather and sheepskin. If it becomes soiled, it may be removed and cleaned using mild soap. To remove the headband cover, peel apart the hook and loop fastener along the flap.

Clear Comfort[™] cushion replacement and maintenance

To maintain good noise reduction, the Clear Comfort cushions in the headset should be replaced periodically; annual replacement is recommended. As the cushions wear, the silicone gel rings may spread apart, causing uneven thicknesses and gaps in coverage. This can lead to air leaks that result in reduced noise attenuation. Popping or fluttering sounds are also common when wearing worn cushions. If the gel leaks, replace the cushion. Frequent flying may require replacement more often.

To order a replacement cushion kit, call the Bose[®] Aviation Headset Service Department (page 23). Before ordering, remove the cushions and inspect the foam liners in the earcups. If you note significant deterioration, order foam liner replacements also.

To remove the cushion and foam liner

- Note: Do not use a hard object such as a screwdriver, which can mar the earcup.
 - 1. Unsnap the trim ring on one earcup by gently prying the edge loose with your fingers.



Once the trim ring has popped loose, work your way around the earcups until the trim ring is completely free.

2. Lift out the old cushion. If you will be installing a new foam liner, proceed to the next section. Otherwise, skip to "To replace the cushion" (page 19).

Figure 12

Unsnapping the trim ring from the earcup

Care and Maintenance

To install a new foam liner

- **Note:** The left and right foam liners are different.
 - 1. Lift the old foam liner out of the earcup.
 - 2. Place the new foam liner in the earcup.

With the correct foam liner in place, nesting along the walls of the cavity, its half-moon shaped opening should cover the microphone, and the small opening in the foam liner should fit over the small hole.

To clean the cushion

Using a baby wipe or a cloth moistened with isopropyl alcohol, gently wipe the side of the cushion that touches the ear. Let the cushion air dry.

To replace the cushion

1. Place the holes in the new cushion onto the posts on the earcup.



2. Align the cushion/trim ring, with its flat edge forward, to the earcup.

Figure 14

Figure 13

onto the earcup

Placing the new cushion

Alignment of earcup, foam liner, cushion, and trim ring



Note: If both old cushions have been removed, note that there are left and right trim rings. The left ring will not fit on the right earcup.

3. Snap the trim ring down firmly along its entire circumference.

- Note: Make sure that the trim ring is not grabbing or pinching the side of the cushion at any spot. If it is, remove the trim ring and reattach the cushion, being sure the cushion skin is not pinched.
 - 4. Replace the foam liner and cushion on the other earcup in the same manner.

In Case of Difficulty

Problem	What to do	
Communication but no active noise reduction in both ears.	 Make sure that your headset is powered, and that the power switch is "ON." If using DC power from the aircraft, check the aircraft fuse or breaker. If using the NICAD battery pack, verify that it is charged. If using the alkaline battery pack, verify that: batteries are installed with the correct polarity. The negative terminal of each battery attaches to the springs in the battery holder (refer to step 4 on page 13). batteries are fully seated and in contact with the top and bottom contacts of the battery holder. If necessary, spin the installed batteries once with your thumbs to fully seat them (refer to step 5 on page 13). batteries are fresh. the headset plug is fully seated in battery pack (refer to step 11 on page 14). 	
Active noise reduction but no (or very low volume) communication in both ears.	Check to see if the volume controls are turned too low (rotate up to increase the volume).	
Reduced active noise reduction, intermittent clicking sounds, or communication distortion in a loud environment.	Check the holes at the bottom of each earcup to make sure they are not blocked. If dust or dirt has built up here, carefully use a small wire or the end of a bent paper clip to unclog the hole. You may need to remove the microphone to clean the holes.	
Low rumbling sound with the headset turned on in a quiet environment.	 Adjust the earcup fit to create a better seal to your head. Be sure that a hat or eyeglasses do not interfere with the seal. Inspect the seal between the cushion and the earcup. The cushion should sit on the earcup evenly, without gaps. Check the holes at the bottom of each earcup to make sure they are not blocked. If dust or dirt has built up here, carefully use a small wire or the end of a paper clip to unclog the hole. You may need to remove the microphone to clean the holes. 	
Popping sound audible with headset turned on in a loud environment.	 Adjust the earcup fit to eliminate the sound. Inspect the seal between the cushion and the earcup. The cushion should sit on the earcup evenly, without gaps. 	
Squealing, whistling, or chirping sound when the system is turned on.	Check to see if the ear cavity foam liner is missing or severely damaged. If so, refer to "Care and Maintenance" (page 18).	
	Do not attempt to disassemble or service the inside of the earcups or other parts of the headset. Only the microphone boom assembly, Clear Comfort [™] cushions, trim rings, foam liners, headband cover, and foam pad are designed for replace- ment by the user. For instructions on how to care for your headset and how to replace the cushions, refer to "Care and Maintenance" (page 18). If problems persist, contact the Bose [®] Aviation Headset Service Department (page 23).	

Sound pressure levels (SPL) are relative to 20 micro Pascal.

Earphones

Damage could occur to avionics equipment if it was manufactured for use only with 600Ω (ohm) headsets. If in doubt, consult the avionics equipment manufacturer.

Impedance

In mono mode: 480Ω (on) and 190Ω (off) at 1kHz.

In stereo mode: left, 500Ω (on), 190Ω (off); right, 2000Ω (on), 190Ω (off).

Frequency response

20Hz - 15kHz

Sensitivity

90dB SPL measured at 1mW, 1kHz, full volume on flat plate coupler

Microphone

Bias Required: 8 to 16VDC through 220Ω to 2200Ω

Sensitivity:

Depends upon bias and radio AC input impedance. Typical output is 300mV at 114dB SPL. To assure proper modulation of your radio, it is recommended that you have your avionics technician adjust its input to match the output of your headset's microphone.

Active noise reduction

Active Noise Reduction Bandwidth: 30Hz - 700Hz

Noise floor

28dBA SPL (typical)

Maximum ambient noise level

Approximately 118dB SPL at full cancellation

Voltage

7-32VDC

Current

60mA typical, 120mA maximum operating

Fuse/breaker recommended

1/2 amp fast blow (AGC 1/2 fuse)

Headset Weight

22 oz. (567 grams)

Temperature and Altitude (Category A1)

Operating Temperature: $+5^{\circ}$ to $+131^{\circ}$ F (-15° to $+55^{\circ}$ C)

Storage Temperature: -67° to +158° F (-55° to +70° C)

Altitude:

15,000 ft. maximum pressure altitude for full cancellation

The Bose[®] Aviation Headset Series II headset, adapter cables, battery packs, and boom microphone are FAA approved to TSO c-57a and c-58a.

The Bose Aviation Headset Series II has been designed to function in or withstand exposure to the following environmental conditions. Environmental categories cited refer to RTCA/DO-160C, 4 Dec 1989 and DO-214, 4 Mar 1993.

Condition	Category
AF Conducted Susceptibility	В
Humidity	В
Magnetic Effect	Z
Power Input	В
RF Susceptibility	Т
Vibration	P&S
Voltage Spike	А
Shock drop12 times, 1 meter onto concrete)

Service and Warranty Information

Service

Bose[®] Aviation Headset Service Department 145 Pennsylvania Avenue Framingham, MA 01701-9168 U.S.A.

TEL: 1-800-233-4416 (U.S.) 1-508-879-7330, ext. 62006 (outside U.S.) FAX: 1-508-820-3465

Contact the Bose Aviation Headset Service Department for:

- accessories.
- technical advice.
- installation information.
- warranty and repair information.

If your headset must be returned for service:

- 1. Request a return authorization number from the Bose Aviation Headset Service Department (see above).
- 2. Securely pack the headset, enclosing your name, address, daytime telephone number, and a description of the problem.
- 3. Clearly mark the outside of the package with your return authorization number, insure your headset, and send it to the address above.

Warranty period

Limited Two-Year Warranty: Bose Corporation (Bose) warrants this product to be free from defects in material and workmanship for a period of two years from the date of purchase. The ear cushions are not included in this warranty; annual replacement of cushions is recommended. See "Care and Maintenance" (page 18).

Service and Warranty Information

Limited warranty Bose® product

What is covered

All parts defective in material or workmanship.

For how long

At least one year from the purchase date, or longer if specified in your owner's manual, but not longer than five years from the purchase date.

What we will do

We will, at our sole option, repair or replace any defective parts free of charge.

What we will not do

Pay shipping or transportation charges from you to us.

What you must do

- 1. Return product personally with proof of purchase from an authorized Bose dealer to your authorized Bose dealer, or
- 2. Return product personally with proof of purchase from an authorized Bose dealer to the nearest Bose Service Agency, or
- Return product personally with proof of purchase from an authorized Bose dealer directly to the Bose organization in your country. If you elect to return the product directly to a Bose organization,
 - Contact the Bose organization in your country for specific return and shipping instructions;
 - B. Properly pack the product in the original carton for shipping. If you need a new carton, contact the Bose organization in your country for a new carton available at a nominal charge;
 - C. Label and ship, freight prepaid, to the address provided by the Bose organization in your country, and
 - D. Place any necessary return authorization number prominently on the outside of the carton. (Cartons not bearing a return authorization number, where required, will be refused.)

Other conditions

This warranty is fully transferable provided the current owner furnishes the original proof of purchase from an authorized Bose dealer. THE PROVISIONS OF THIS WARRANTY ARE IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BOSE'S MAXIMUM LIABILITY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID BY YOU FOR THE PRODUCT. IN NO EVENT SHALL BOSE BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR INDIRECT DAMAGES. This warranty does not cover a defect that has resulted from improper or unreasonable use or maintenance, accident, improper packing, or unauthorized tampering, alteration, or modification as determined solely by us. This warranty is void if the label bearing the serial number has been removed or defaced.

Other law rights

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or country to country. Some places do not allow limitations on implied warranties or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

Notes

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