

ACCESS VHF SERIES USER GUIDE

This user guide provides detailed instructions for your Access VHF series wireless system. To get your system up and running in minutes, see the Access VHF Series Quick Set Up Guide.

Your new Access VHF Series system is designed to give you both the freedom of a wireless system and world-famous Shure sound quality. This manual covers both Single antenna and Diversity versions of the Access VHF Series systems: the AXS31/58 handheld systems; the AXSGW bodypack systems; the AXSHW Headset systems; and the AXSLWD lavalier microphone system.

Wireless System	AXS31 and AXS58	AXSGW	AXSHW	AXSLWD
Components	Hand-held systems for singers.	Bodypack systems for electric and bass guitarists. Can also be used with other electric instruments	Bodypack system for applications requiring hands-free operation, such as aerobics or percussion	Bodypack system for public speaking, theater, or business presentations.
Transmitter	AXH2 Handheld Transmitter	AXB1G Bodypack Transmitter		AXB1 Bodypack Transmitter
Microphone	SM58 or BG3.1	—	WH20 Headset Microphone	WL93 omnidirectional lavalier
Receiver	AXR3 single antenna or AXR4N Diversity			
Power Supply	PS20 (105–125 VAC, 60 Hz)			
Supplied Accessories	Carrying and storage case; Receiver feet; Hook and loop fastening strips; gain adjustment screwdriver			
	microphone stand adapter	1/4" to 1/4" guitar cables (2)		

RECEIVER FEATURES

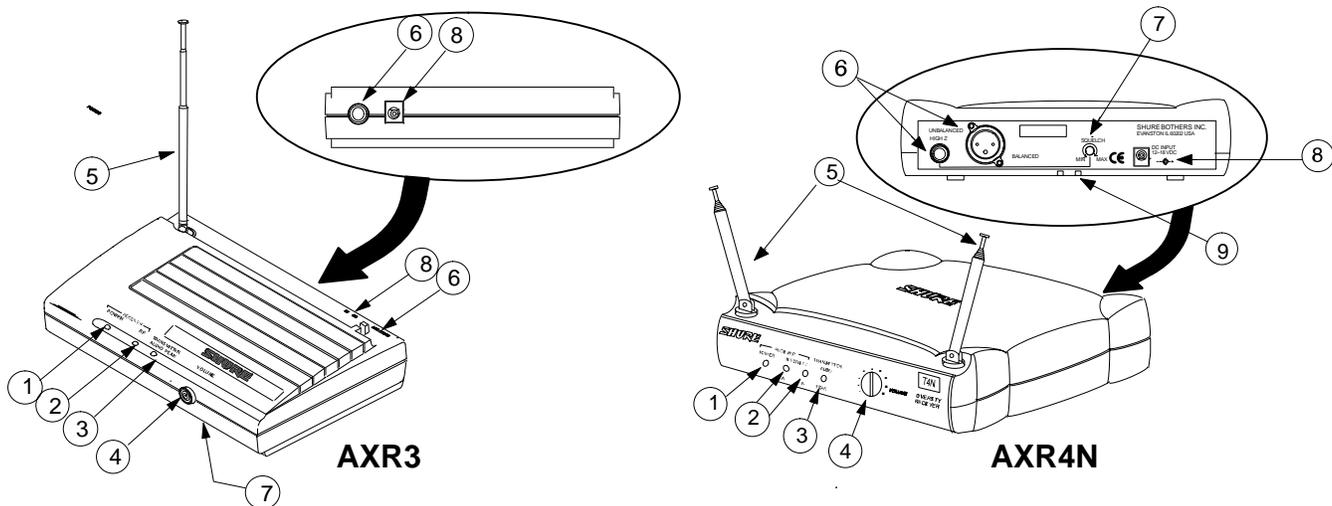


FIGURE 1. AXR3 AND AXR4N RECEIVER FEATURES

- 1. Power On Indicator:** Glows green when the receiver is powered on.
- 2. RF Signal Indicator:** **AXR3:** Glows yellow when RF (radio frequency) signals are received. **AXR4N:** One of two indicator lights glows when RF is received by antenna A or B.
- 3. Audio Peak Indicator:** Flashes red when the audio signal received approaches overload clipping level.
- 4. Volume Control:** Adjusts the output volume of the receiver. *Does not affect Transmitter Audio Peak indicator.*
- 5. Telescoping Antenna(s):** Receives signals from the transmitter.
- 6. Audio Output:** Provides mic level signal for connection to amplifiers or mixing consoles. **AXR3:** 1/4 inch phone jack. **AXR4N:** 1/4 inch phone jack and male XLR connector.
- 7. Squelch Control:** This control is factory pre-set and normally requires no adjustment. See *Wireless System Adjustments* at the end of this guide.
- 8. Power Input:** Accepts power from supplied AC adapter.
- 9. Power Cable Retainer:** **AXR4N** only. Secures the AC adapter cable to the receiver.

TRANSMITTER FEATURES

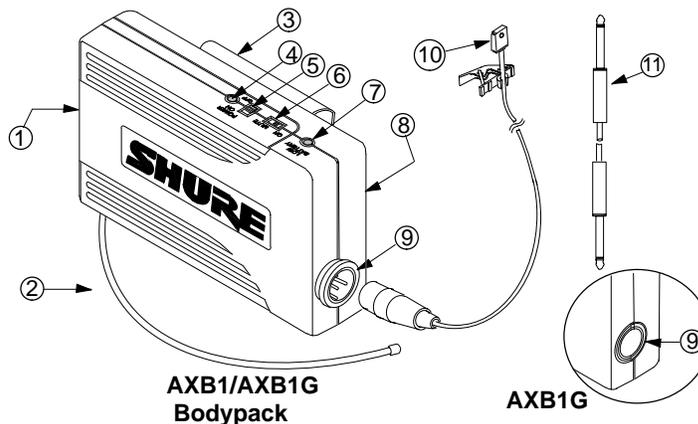


FIGURE 2. AXB1, AXB1G, AND AXB11 BODYPACK TRANSMITTER FEATURES

1. **Battery Compartment.** Holds one 9V alkaline battery.
2. **Antenna.** For best operation, the antenna *must* hang vertically, and should not be coiled or bundled.
3. **Belt Clip.** Secures the transmitter to a belt, waistband or guitar strap.
4. **Power On Indicator.** Glows green when transmitter is powered on.
5. **Power Switch.** Recessed to prevent accidental turn-off.
6. **Mute Switch.** Slide to ON for normal operation. Slide to MUTE to prevent sounds from being transmitted to the receiver. *Muting the transmitter does not turn off transmitter power.*
7. **Low Battery Indicator.** Glows red when one hour or less of operating time remains and transmitter battery should be changed.
8. **Audio Gain Control.** Provides audio level adjustment to accommodate different sound sources (e.g., speaking or playing an instrument). A small screwdriver is supplied to make adjustments.
9. **Input Connector.** **AXB1:** Tini Q-G[®] connector provides connection to a variety of lavalier and headset microphone cables and to the Shure WA302 instrument adapter cable. **AXB1G:** Accepts a standard 1/4 inch or guitar cable plug.
10. **Lavalier Microphone.** WL93 omnidirectional condenser microphone supplied with a mount that clips onto a tie, lapel, or acoustic instrument.
11. **Cables.** **AXB1G:** 1/4 inch to 1/4 inch guitar cable for electric guitar or other electric instruments.

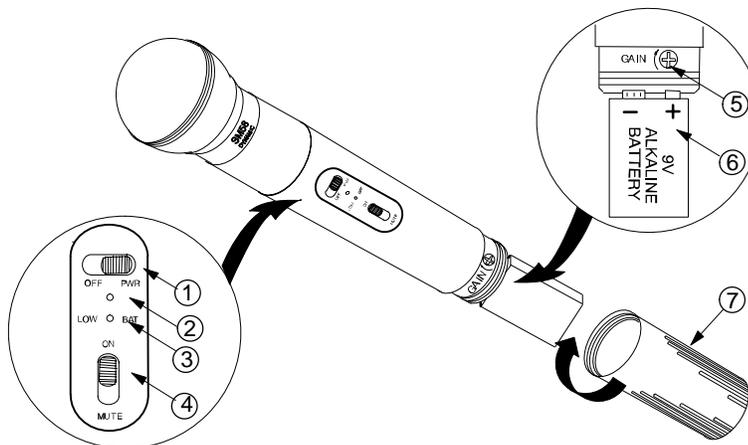


FIGURE 3. AXH2 MICROPHONE-TRANSMITTER FEATURES

1. **Power Switch.** Recessed to prevent accidental turn-off.
2. **Power On Indicator.** Glows green when power is on.
3. **Low Battery Indicator.** Glows red when one hour or less of operating time remains and battery should be changed.
4. **Mute Switch.** Slide to ON for normal operation. Slide to MUTE to prevent sounds from being transmitted to the receiver. *Muting the transmitter does not turn off power.*
5. **Audio Gain Control.** Allows you to adjust the transmitter to match the loudness of your vocals. A small screwdriver is supplied to make adjustments.
6. **9V Alkaline Battery (shown installed).** Provides power to the microphone-transmitter.
7. **Battery Cover.** Unscrews for access to the 9V alkaline battery and gain control.

SYSTEM SETUP

BATTERY INSTALLATION

- Slide the transmitter POWER ON/OFF switch to the OFF position.
- AXB1, AXB1G:** Press down on the OPEN side of the battery compartment cover, slide it back and flip it open, as shown in Figure 4.
AXH2: Unscrew the transmitter battery cover to expose the battery terminals, as shown in Figure 3.

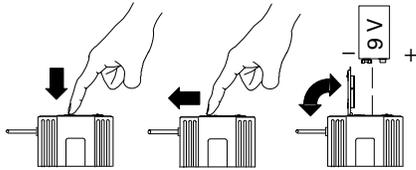


FIGURE 4. BATTERY INSTALLATION

- Insert a fresh 9V alkaline battery into the battery compartment (A Duracell MN1604 is recommended). A fresh 9V alkaline battery will typically provide 18 hours of performance time. A fully charged 8.4V NiCad battery will provide about 2 hours of performance time.
IMPORTANT: Carbon-zinc and zinc-chloride batteries will not provide adequate power and are not recommended.
- Replace the battery cover.

HEADSET ASSEMBLY

- Refer to the tag attached to the headset for assembly instructions. After assembling the WH20, adjust the headband and place it on your head.
- Position the microphone over the corner of your mouth, about 1/2 inch away. See Figure 5.
- To reduce pops and breath noise, place the supplied foam windscreen over the microphone.

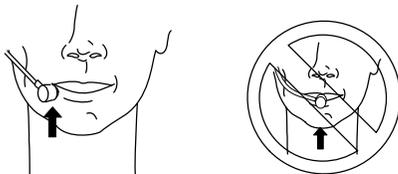


FIGURE 5. HEADSET MICROPHONE POSITION

BODYPACK TRANSMITTER SETUP

- Attach the transmitter to your belt, guitar strap, or waistband as shown in Figure 6. Depress the tab marked PRESS and slip the belt or strap between the transmitter body and the belt clip. For added stability, draw the strap or belt toward the clip's top wire, especially when using thin guitar straps.

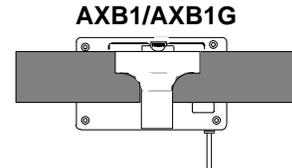


FIGURE 6. TRANSMITTER SETUP

- Plug your guitar, headset microphone, or lavalier microphone into the transmitter.

RECEIVER SETUP

- Plug one end of the AC power adapter into the DC INPUT connector on the back of the receiver. **AXR4N:** Loop the power cable around the cable retainer on the bottom of the receiver. See Figure 7. Plug the other end into an AC power source (use PS20 for 105–125 VAC). The green POWER light on the receiver will glow.

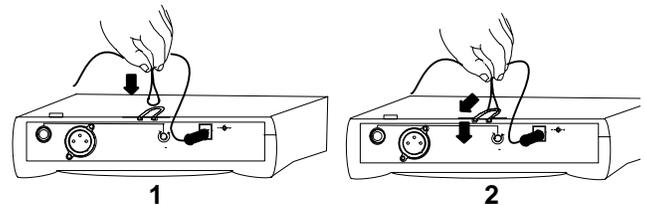


FIGURE 7. AXR4N POWER CABLE RETAINER

- Connect the receiver output. **The Guitarist:** plug a standard guitar cable (two provided) into the receiver's output connector. Plug the other end into a guitar amplifier, as shown in Figure 8. **AXSHW, AXS31, AXS58 or AXSLWD:** Use a cable with a 1/4 inch phone plug (**AXR3, AXR4N**) or a female XLR connector (**AXR4M**) to connect the receiver to a mic level input of a mixer or PA system, as shown in Figure 8.
- Extend antenna(s). **AXR3:** The antenna should be fully extended and vertical, as shown in Figure 8. **AXR4N:** The antennas should be fully extended and angled away from each other, at an angle of 45 degrees from vertical, as shown in Figure 8.

WIRELESS SYSTEM ADJUSTMENTS

TRANSMITTER AUDIO GAIN ADJUSTMENT

AXSGW Systems: The audio gain control on the transmitter in these systems is factory-preset at the minimum setting (full counterclockwise) to reduce the risk of overload and distortion. If the red TRANSMITTER AUDIO PEAK light on the receiver *does not* flicker when the guitar is played loudly and its volume controls are turned all the way up, increase the transmitter gain level. This will ensure the best signal-to-noise ratio for performance. See Figure 9.

AXSHW Systems: The audio gain control on the transmitter in the headset systems is factory preset at the maximum setting (full clockwise). This is because the microphone in the WH20 is a low output, dynamic microphone. It may be necessary to reduce the transmitter gain until the red TRANSMITTER AUDIO PEAK light flickers only when you speak or sing loudly. This will ensure the best signal to noise ratio for performance. See Figure 9.

AXS31/AXS58/AXSLWD: The audio gain controls on the transmitters in these systems have been factory preset at the mid-range position. This will provide the best results in most applications. However, for singers or presenters with quiet voices, the audio gain may need to be increased for better signal-to-noise ratio. Increase the gain until the receiver's TRANSMITTER AUDIO PEAK light flickers when you speak in a loud voice. For those with loud voices, the preset gain level may be too high, causing unwanted distortion. In this case, the PEAK indicator will glow continuously when you sing or speak in a loud voice and the gain level should be reduced. See Figure 9.

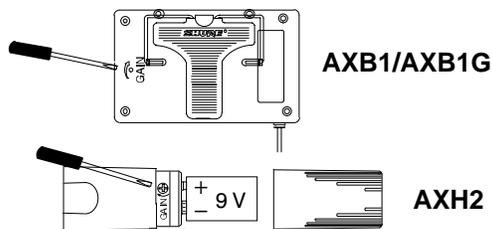


FIGURE 9. GAIN ADJUSTMENT

- **To Increase Gain:** Rotate the transmitter gain control clockwise with the supplied screwdriver until the red TRANSMITTER AUDIO PEAK light on the receiver flickers when the guitar is played loudly, or when you sing or speak in a loud voice.
- **To Reduce Gain:** Rotate the transmitter gain control counterclockwise until the red TRANSMITTER AUDIO PEAK light on the receiver flickers only when the guitar is played loudly, or when you speak or sing in a loud voice.
- **To Return Audio Gain to the Factory Setting:** Rotate the transmitter audio gain control counterclockwise as far as it will go (AXSGW systems), clockwise as far as it will go (AXSHW systems), or to mid position (AXS31, AXS58 and AXSLWD Systems).

RECEIVER VOLUME ADJUSTMENT

The volume control on the front panel of the AXR3 and AXR4N receivers can be adjusted to make the wireless system output level identical to that of a cabled guitar or bass or wired microphone. After making any necessary transmitter gain adjustments, adjust the receiver volume control until the output reaches the desired level. Rotate the volume control clockwise to *increase* output. Rotate it counterclockwise to *decrease* output.

RECEIVER SQUELCH ADJUSTMENT

The squelch control on the AXR3 and AXR4N receivers is factory preset for optimum performance. No further adjustment is normally required. It is possible to adjust the squelch control setting to emphasize either signal quality or system range:

- *Turning the squelch control clockwise causes the receiver to demand a higher quality signal (less noise before muting), but decreases operating range.*
- *Turning the squelch control counterclockwise allows a lower quality signal through (more noise before muting), but increases operating range.*

To return the receiver squelch control to the factory setting, rotate it to the mid-range position (so the slot is vertical).

ABOUT THE SHURE NOISE SQUELCH SYSTEM

Conventional squelch circuits analyze RF signal strength. Consequently, they cannot discriminate between noise and desired signals. When a wireless system is used in a noisy RF environment, conventional circuits may "open" unexpectedly, sending loud bursts of noise through the receiver when the transmitter's signal is weak or turned off. Unlike conventional wireless systems, Shure T-Series systems use a noise squelch circuit that analyzes *signal quality* instead of signal strength. A special detector monitors the level of high frequency noise. When the transmitter signal is strong, the system's noise level is low and the receiver sends audio through. When the transmitter signal is weak or absent, the system's noise level is high and the squelch circuit will mute the receiver. This virtually eliminates the possibility of annoying bursts of noise coming through your receiver.

TIPS FOR ACHIEVING MAXIMUM PERFORMANCE

- *Make sure you can always see a receiver antenna from the transmitter position.*
- *Keep the distance between the transmitter and the receiver antennas short.*
- *Avoid placing the receiver antennas near metal surfaces and obstructions. They will reduce system performance.*
- *To mount the receiver on a flat surface, attach the four adhesive rubber feet or secure the receiver to the surface with the supplied cloth fastening strips.*

TROUBLESHOOTING

PROBLEM	INDICATOR STATUS			SOLUTIONS	
	☀ = on ⚡ = flickers on loud peaks				
	AXR4N RECEIVER		TRANS-MITTER		
	AXR3 RECEIVER				
No sound.	POWER ☀ ON	ANTENNA ○ A ○ B	TRANSMITTER AUDIO ○ PEAK	POWER ○ LOW BATT ○	<ul style="list-style-type: none"> Slide transmitter POWER switch to ON. Make sure battery is inserted properly (+/- battery terminals must match transmitter terminals). Insert fresh battery.
	POWER ○	RF ○	PEAK ○	POWER ☀ LOW BATT ○	<ul style="list-style-type: none"> Make sure AC adapter is securely plugged into electrical outlet and into DC input connector on rear panel of receiver. Make sure AC electrical outlet works and supplies proper voltage.
	POWER ☀	ANTENNA ☀ ↔ ☀ A B	TRANSMITTER AUDIO ○ PEAK	POWER ☀ LOW BATT ○	<ul style="list-style-type: none"> Slide transmitter MUTE switch to ON.
	POWER ○	RF ○	PEAK ○	POWER ☀ LOW BATT ○	<ul style="list-style-type: none"> Extend antenna(s). AXR4N receiver antennas should point away from each other at a 45° angle from vertical; AXR3 receiver antenna should remain vertical. See Figure 8. Move receiver away from nearby metal objects. Remove obstructions and maintain line of sight between transmitter and receiver. Move transmitter closer to receiver.
	POWER ☀	ANTENNA ○ A ○ B	TRANSMITTER AUDIO ○ PEAK	POWER ☀ LOW BATT ○	
No sound or faint sound.	POWER ☀	ANTENNA ☀ ↔ ☀ A B	TRANSMITTER AUDIO ○ PEAK	POWER ☀ LOW BATT ○	<ul style="list-style-type: none"> Increase transmitter gain until Transmitter Audio Peak light flashes on loud peaks. Turn up receiver volume control as necessary.
	POWER ☀	RF ☀	PEAK ○	POWER ☀ LOW BATT ○	<ul style="list-style-type: none"> Turn up receiver volume control. Check cable connection between receiver and amplifier or mixer.
Sound level from the receiver is different from that of a cabled guitar or microphone.				<ul style="list-style-type: none"> Adjust transmitter gain as necessary. Adjust receiver volume as necessary. 	
Sound level is different when you change guitars.				<ul style="list-style-type: none"> Adjust transmitter gain to compensate for differences between guitar output levels. 	
Distortion increases gradually.			POWER ☀ LOW BATT ☀	<ul style="list-style-type: none"> Replace transmitter battery. 	
Bursts of noise, distortion, or other radio signals interrupt performance.	ANTENNA ☀ ↔ ☀ A B		POWER ○ LOW BATT ○	<ul style="list-style-type: none"> If noise occurs when transmitter is turned off, remove or turn off nearby sources of RF (such as other wireless systems, CB radios, etc.). Use a wireless system that operates on a different frequency. 	
	RF ☀				
Momentary loss of sound as transmitter is moved around performing area (dropouts).	ANTENNA ○ A ○ B		POWER ☀ LOW BATT ○	<ul style="list-style-type: none"> Reposition receiver and perform walk-through test. If audio dropouts persist, mark "dead" spots and avoid them during performance. 	
	RF ○				

SYSTEM AND COMPONENT SPECIFICATIONS

RF Carrier Frequency Range

169.445 to 240.000 MHz

Operating Range: 100 m (328 ft.) under typical conditions

Audio Frequency Response: 50 to 15,000 Hz, ± 3 dB

Image Rejection: 75 dB typical

Spurious Rejection: 75 dB typical

System Distortion (ref. ± 15 kHz deviation, 1 kHz modulation): 0.1% THD typical

Signal/Noise Ratio: 102 dB

Sensitivity: -110 dBm for 12 dB SINAD typical

Operating Temperature Range

-18° to 57° C (0° to 135° F) **NOTE:** Battery characteristics may limit this range.

Battery Life: 18 hours with 9 V alkaline battery (Duracell MN1604 recommended).

AXB1, AXB1G BODYPACK TRANSMITTER SPECIFICATIONS

RF Output	50 mW Typical
Input Configuration	Unbalanced
Connector Type	1/4 Inch (AXB1G); 4-pin Tini Q-G [®] (AXB1)
Actual Impedance	1 M Ω
Maximum Recommended Input Level*	+12 dBV
Minimum Recommended Input Level**	-80 dBV
Connector Pin Assignments (AXB1)	Pin 1:Tied to Ground Pin 2:Tied to +5 V Pin 3:Tied to Audio Pin 4:Tied to 20k Ω Resistor and Audio Ground
Connector Pin Assignments (AXB1G)	Sleeve: Tied to Ground Tip: Tied to Audio
Dimensions	64 mm H x 106 mm W x 24 mm D (2.52" H x 4.17" W x 0.95" D)
Net Weight	96.4g (3.4 oz.)
Power Requirements	9 V alkaline battery (Duracell MN1604 recommended); 8.4 V NiCd battery optional.
Nominal Current Drain	30 mA

* Gain Control at minimum

** Gain Control at maximum

AXH2 HAND-HELD TRANSMITTER SPECIFICATIONS

	AXH2/58 (SM58)	AXH2/31(BG3.1)
RF Output	50 mW Typical (FCC); 20 mW Typical (ETSI)	
Dimensions	236 mm H x 51 mm D (9.29" H x 2.01" D)	222 mm H x 51 mm D (8.74" H x 2.01" D)
Net Weight	295g (10.4 oz.)	266g (9.4 oz.)
Power Requirement	9 V alkaline battery (Duracell MN1604 recommended); 8.4 V NiCd battery optional.	
Nominal Current Drain	30 mA	30 mA

AXR3 AND AXR4N RECEIVER SPECIFICATIONS

	AXR4N	AXR3
Connector	3-Pin XLR (Male) and 1/4" Phone Plug	1/4" Phone Jack
Maximum Output Levels at 15 KHz deviation	1/4": +5 dBV XLR: -10 dBV	-6.8 dBV
Nominal Output Levels	1/4": -8 dBV XLR: -30 dBV	-32 dBV
Output Configuration	Active Balanced	Unbalanced
Actual Impedance	3.3 K Ω	1 K Ω
Connector Pin Assignments	XLR: Pin 1: ground; Pin 2: hot; Pin 3: cold 1/4": Tip: hot; Sleeve: ground.	Tip: hot; Sleeve: ground
Dimensions (AXR4N)	41 mm H x 197 mm W x 138 mm D (1.625" H x 7.77" W x 5.42" D)	
Dimensions (AXR3)	35mm H x 152 mm W x 98 mm D (1.38"H x 5.98" W x 3.85" D)	
Net Weight (AXR4N)	435 g (15.4 oz.)	
Net Weight (AXR3)	192 g (6.8 oz.)	
Power Requirements	12–18 VDC nominal, 200mA	
Power Supply	120 V or 230V AC adaptor with 2.1 mm female plug	
Voltage/Current/Phantom Power Protection	Yes	Yes

Certification

AXB1G, AXB1: Accepted under FCC Parts 74 and 90. Certified by IC in Canada under TRC-78.

AXH2/31, AXH2/58: Type Accepted under FCC Parts 74 and 90. Certified by IC in Canada under TRC-78. Conforms to European Union directives, eligible to bear CE marking; meets European Union Requirements. Type Approval: pr I-ETS 300 422, BZT 17 TR 2019, and BAPT 122 R 1. EMC Immunity: pr ETS 300 445.

AXR3, AXR4N: Approved under the Declaration of Conformity provision of FCC Part 15 (AXR3). Certified by IC in Canada under RSS 123 (AXR4N). Conforms to European Union directives, eligible to bear CE marking; meets European Union Requirements. EMC Immunity: pr ETS 300 445. Power supply meets Low Voltage Directive: 73/23/EEC.

ACCESSORIES, LICENSING AND WARRANTY

FURNISHED ACCESSORIES

Screwdriver	65A1659
Sew-in Mounting Block (WL93 AXSLWD Only)	65B1733*
Receiver AC Adapter	PS20 (120V)
Guitar Cables (2) (AXSGW systems Only)	WA303
Swivel Adapter (AXS31/58 systems Only)	WA371
Plastic Carrying Case (Diversity Systems)	WA605
Plastic Carrying Case (Single Antenna systems) ..	WA600

OPTIONAL ACCESSORIES

Anti-Roll Device for Handheld Transmitters	A1K
Neoprene Backpack Belt Pouch	WA570
Line Matching Output Transformer (AXR3 Receiver) .	A95U
1.8 Meter (6 ft.) Receiver-Mixer Cable	WA410
Rack-Mount Kit (AXR4N Diversity Systems Only)	URT
Amp/Powered Mixer stand for Receivers	WA595
AXSLWD Systems Only	
Tan version of WL93	WL93T
Single-Mount Tie Clip (2) (WL93)	RK354SB
Dual-Mount Tie Clip (WL93)	RK307DB
Black Windscreen (4) (WL93)	RK355WS
Tan Windscreen and Tie Clip (2 each) (WL93)	RK304T
AXSHW Systems Only	
Foam Windscreens (2) and Clothing Clip (WH20)	RK318WS
Croakies® Headband (WH20)	RK319
Croakies® Headband and Wire Frame (WH20) ..	RPM600
Microphone and Boom Assembly (WH20) 1/4" plug	RPM100

* Furnished in multiples of 4.

** Includes 2 tie bars and 2 windscreens.

For additional microphone service or parts information, please contact Shure's Service department at 1-800-516-2525 or Shure's website at www.shure.com. Outside the United States, please contact your Authorized Shure Service Center.

WARRANTY INFORMATION

Shure Incorporated ("Shure") hereby warrants that these products will be free from defects in material and workmanship for a period of two years from the date of purchase for all microphone cartridge and housing assembly parts and, for a period of one year from the date of purchase, all transmitter and receiver parts. At its option, Shure will repair or replace the defective product and promptly return it to you. You should retain proof of purchase to validate the purchase date and return it with any warranty claim. If you believe this product is defective within the warranty period, carefully repack the unit, insure it, and return it postpaid to:

Shure Incorporated
Attention: Service Department
222 Hartrey Avenue
Evanston, IL 60202-5730 U.S.A.

Customers outside the U.S.A. should ship the product to the authorized Shure Distribution Center in their region.

DECLARATION OF CONFORMITY

We of

Shure Incorporated
 222 Hartrey Ave.
 Evanston IL 60202-3696 U.S.A.
 847-866-2200

declare under our sole responsibility that the following products,

Model: AXR3	Name: AXR3 Receiver
Model: AXR4N	Name: AXR4N Diversity Receiver

were tested and found to comply with Part 15 of the FCC rules.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Testing was completed by the following NVLAP or A2LA accredited laboratory:

BZT privat CETECOM GmbH
 66117 Sarbrücken
 Unterturkheimer StrBe 6-10
 Deutschland
 telephone +49 681 598 - 9000
 fax +49 681 598 - 9075

Shure Inc., Manufacturer.

Signed:  Date: June 15, 1999

Name, Title: Craig Kozokar, Senior Quality Engineer

ADDITIONAL INFORMATION FOR THIS SHURE WIRELESS SYSTEM

This Shure wireless transmitter is accepted under FCC Part 74 and/or Part 90.

IMPORTANT: Licensing of Shure wireless microphone equipment is the user's responsibility, and licensability depends on the user's classification and application, and on the selected frequency. Shure urges the user to consult the appropriate telecommunications authority before choosing and ordering frequencies.

Changes or modifications not expressly approved by Shure Inc. could void your authority to operate this equipment.

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