AirLine
SYNTH

Owners Manual

SAMSON®

Introduction

Welcome to Samson AirLine Synth—the next generation of wireless systems! Wireless microphone and instrument systems were originally developed to eliminate cables, providing unparalleled freedom of movement. AirLine Synth takes this concept to a new level with transmitters so small, lightweight and aerodynamic, they are nearly invisible, providing a completely "hassle-free" user experience. To create the world's smallest frequency agile wireless transmitters, we developed new proprietary technology. Featuring miniaturized circuitry and the ability to operate on a single AA battery (with 10 hours typical battery life), these transmitters also provide significantly improved wireless reception and sound quality. What's more, the AR300 receiver developed especially for the AirLine Synth guitar system provides an automatic Channel Scan function to help you find the clearest frequency to operate on. The convenient, all metal half-rack chassis design features a large backlit LCD display and includes a rackmount kit to install in a standard 19-inch equipment rack. The Samson AirLine Synth UHF microphone system is designed to replace the cable between your microphone your PA mixer, freeing you to roam the stage or even visit the audience in the middle of your performance! It operates in the UHF frequency range and contains an AR300 "half-rack" receiver and the AX300 plug-in micro-transmitter with standard XLR connector designed to fit the included Samson Q7 or any other dynamic microphones.
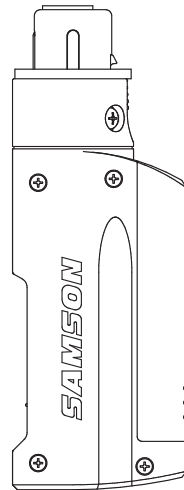
In this manual, you'll find a detailed description of the features of your AirLine Synth system, as well as a guided tour through all components, step-by-step instructions for setting up and using your system and full specifications. If your AirLine Synth system was purchased in the United States, you'll also find a warranty card enclosed—don't forget to fill it out and mail it! This will enable you to receive online technical support and will allow us to send you updated information about this and other Samson products in the future. If your AirLine Synth system was purchased outside of the U. S., contact your local distributor for warranty details. Also, be sure to check out our website (http://www.samsontech.com) for complete information about our full product line.

SPECIAL NOTE for U.S. purchasers: Should your AirLine Synth system ever require servicing, a **Return Authorization number (RA**) is necessary. Without this number, the unit will not be accepted. If your AirLine Synth system was purchased in the United States, please call Samson at 1-800-372-6766 for a Return Authorization number prior to shipping your system. If possible, return the unit in its original carton and packing materials. If your AirLine Synth system was purchased outside of the U. S., contact your local distributor for information.

QuickStart

If you've had some prior experience using wireless systems, these QuickStart instructions will get you up and running with your AirLine UHF microphone system in a matter of minutes! Detailed instructions for setting up and using your AirLine Synth system can be found on page 15 of this manual, and the "Guided Tour" sections on pages 10- 14 provide full descriptions of all AirLine component controls and displays.

1. Unpack the AR300 receiver and AX300 transmitter and plug the AX300 into the include Samson Q7 or any dynamic microphone.

2. Physically place the AR300 receiver near your mixer. Extend its antennas vertically and spread the tips horizontally outwards.

3. Set the power switch on your AX300 transmitter to the "off" position (away from the arrow) and place a fresh AA battery in it. Then turn the transmitter back on momentarily; its LED will flash once and then go off if the battery is sufficiently strong. Once battery strength is verified, turn the transmitter off again, then put it aside for now.

4. Connect the included AC power supply to the rear of the AR300 and then to an available wall socket. Turn the AR300 on momentarily to confirm that the unit has power. Then turn the AR300 power off.

5. Turn your mixer off, or mute the channel and make the physical cable connection between an audio input and the AR300 output jack.

6. Turn the Level knob on the AR300 completely counterclockwise, then turn its power on.

7. Now to set the channel, press and hold the EDIT control until the display shows the group number with three asterisks. Next, the AR300 will automatically find the clearest channel and you will see it in the Channel number of the display just before the IR SET will begin.
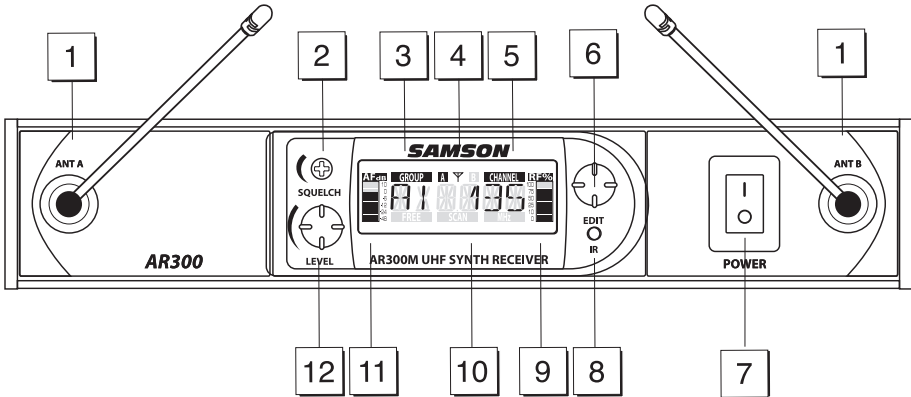
8. Once you see the IR SET flashing in the LCD display, hold the transmitter, with the bottom of the AX300 facing towards the AR300, approximately 6 inches away from the receiver and turn the AX300 power switch on. The AR300 will transmit the channel number to AX300 over infrared light and you will see the corresponding absolute channel number in the transmitter LCD.

8. Turn on the mixer, or unmute the channel, but keep its volume all the way down. Begin speaking or singing at a normal performance level while observing the AF Meter. If the AF Meter reads above "0" (indicating a Peak condition) even with the AR300 Level control fully counterclockwise, slowly adjust the GAIN on the inside of the AX300 to the point where the AF Meter occasionally reads "0" during the very loudest passages, then back it off just slightly. Finally, raise the level of your connected mixer until the desired volume is reached

9. Do a walkaround through the intended area of coverage while observing the receiver's RF Meter; it should continue to read about "75%", indicating sufficient RF reception in all areas of coverage. If not, reposition the AR300 or its antennas as necessary.

10. If you hear any spurious noise from the receiver output when the transmitter is turned off, use the supplied plastic screwdriver to adjust the AR300 Squelch control, slowly turning it clockwise to the point at which the noise disappears.
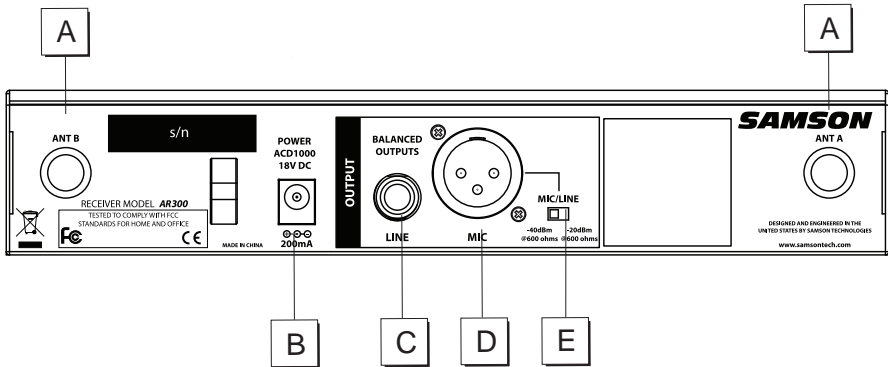
Guided Tour - AR300 Receiver / Front Panel

1. **Antennas (A and B)** - The antenna mountings allow full rotation for optimum placement. In normal operation, both Antenna A (the antenna on the left) and Antenna B (the antenna on the right) should be placed in a vertical position. Both antennas can be folded inward for convenience when transporting the AR300. *See the "Setting Up and Using Your AirLine Synth System" section on page 15 in this manual for information about antenna installation and positioning.*

2: **Squelch** – This control determines the maximum range of the AR300 before audio signal dropout. Although it can be adjusted using the supplied plastic screwdriver, it should normally be left at its factory setting. *See the "Setting Up and Using Your AirLine Synth System" section on page 15 in this manual for more information.*

3: **Group Channel** - This displays shows the current Group and Group Channel number. A letter indicates Groups and the Group Channel number is indicated by 0 through 9.

4: **Antenna indicators** – In order to maximize reception and distance, the AR300 implements true diversity receiver technology with dual RF strips. The A and B antenna icon shows which of the receiver's two RF strips is active.

5: **Absolute Channel** – This display indicates the specific channel number for each available frequency.
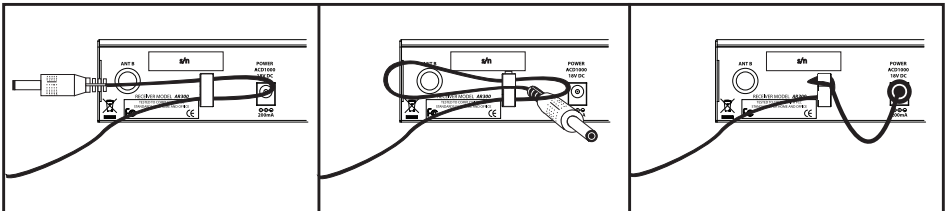
Guided Tour - AR300 Receiver / Front Panel

6: **EDIT Control** – This rotary encoder control knob is used to control and set several menu functions and parameters displayed in the LCD display and it is also used to preform the automatic Channel Scan.

7: **Power Switch** - Use this to turn the AR300 power on and off. When the receiver is on, the LCD backlight is lit.

8: **IR Transmitter** – During "IR SET" an Infrared light is used to set the transmitter channel.

9: **RF Meter** – 12-segment bar meter used to display the level of the radio frequency reception.

10: **LCD Display** – The 47mm x 17mm backlit display show information for Frequency, Channel, Group, Absolute Channel, Antenna, AF, RF, Scan, and IR Set.

11: **AF Meter** - 12-segment bar meter used to display the amount of the audio input level.

12: **Level control** - This knob sets the level of the audio signal being output through both balanced output connectors on the rear panel (see C and D on page 12 in this manual). Reference level is obtained when the knob is turned fully clockwise (to its "10" setting).

Guided Tour - AR300 Receiver / Rear Panel

A: **Antenna socket** - D hole knockout for mounting the antennas to the rear panel using the optional rear antenna kit.

B: **DC input** - Connect the supplied power adapter here, using the strain relief as shown in the illustration below. **WARNING: Do not** substitute any other kind of power adapter; doing so can cause severe damage to the AR300 and will void your warranty.

C: **1/4-inch output*** - Use this 1/4" jack when connecting the AR300 to your guitar amp or to line level equipment. The output connection can be either balanced or unbalanced. Wiring is as follows: tip hot, ring cold, sleeve ground.

D: **XLR output*** - Use this electronically balanced low impedance (600 Ohm) XLR jack when connecting the AR300 to professional (+4) audio equipment. Pin wiring is as follows: Pin 1 ground, Pin 2 high (hot), and Pin 3 low (cold).

E: **Audio Output Level switch** - Sets the audio output level attenuation of the XLR output to -20 dBm (line level) or -40 dBm (mic level). *See "Setting Up and Using Your AirLine Synth System" on page 15.*

* If required, both outputs can be used simultaneously.

Guided Tour - AX300 Transmitter

1: **Plug** - Insert this standard 3-pin XLR plug into your the included Samson Q7 or any dynamic microphone.

2: **LCD Display** – This three digit Liquid Crystal Display indicates the Absolute Channel number that the transmitter is set to.
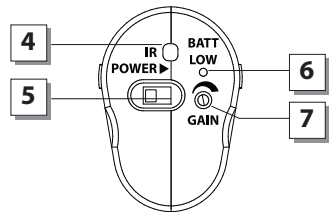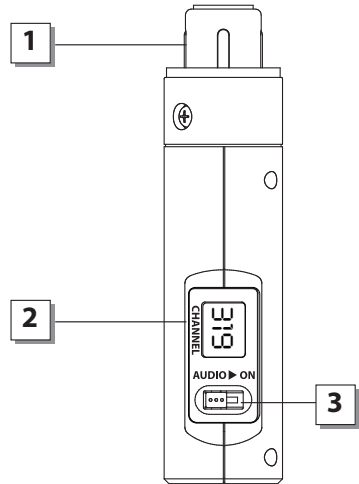
3: **Audio On switch –** This switch is used to temporarily turn off the audio output of the transmitter. Move this switch away from "ON" to turn off the output and move the switch in the direction of "ON" to turn the output on.

4: **IR Lens** - This acrylic window is used to capture the infrared signal sent from the AR300 during the IR SET to channelize the AX300.

5: **Power switch** - Move this switch in the direction of the arrow to turn the AR300 power; move it away from the arrow to turn power off.

6: **Power / Battery LED** - This red LED flashes once when the AX300 is first turned indicating the transmitter has power. It will remain off as long as they battery is a good operating level. The LED lights steadily red when there are less than 2 hours of battery power remaining, indicating that the battery needs to be changed. In order to avoid compromising audio fidelity (or having the AX300 stop working completely), you should always replace the battery with a fresh one immediately whenever this LED lights red.
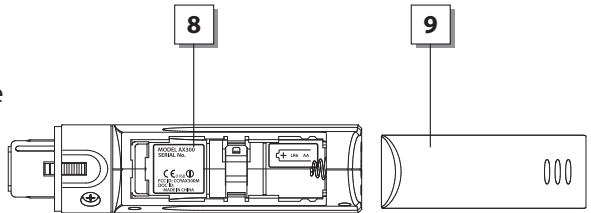
7: **Gain** - Move this control in the direction of the arrow (counterclockwise) to reduce the output of the AX300 when the speaker's or singer's voice is putting out too hot of a signal. *See the "Setting Up and Using Your Synth AirLine Synth System" section on page 15 in this manual.*

Guided Tour - AX300 Transmitter
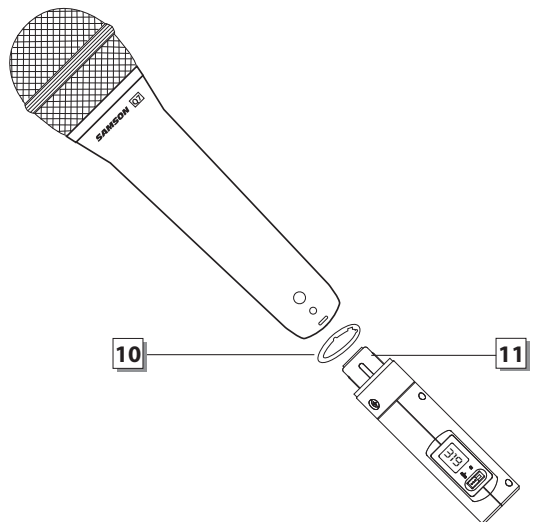
8: Battery compartment - Insert a standard AA alkaline battery here, being sure to observe the plus and minus polarity markings shown. We recommend the Duracell type battery. Although rechargeable Ni-Cad batteries can be used, they do not supply adequate current for more than four hours. **WARNING:** Do not insert the battery backwards; doing so can cause severe damage to the AX300 and will void your warranty.

9: Battery cover - Pull back gently on this cover at the ribbing and pry upwards to remove. *See the "Setting Up and Using Your Synth AirLine Synth System" section on page 12 in this manual.*

10: XLR connector - Connect this standard female XLR connector into any standard wired dynamic microphone in order to make it a wireless mic.

11: Rubber gasket - If necessary, use this provided rubber gasket in order to make a solid connection between the AX300 XLR connector and your microphone (note that not all microphones require its use).

Setting Up Your AirLine Synth System

The basic procedure for setting up and using your AirLine Synth system takes only a few minutes:

1. Remove all packing materials (save them in case of need for future service) and check to make sure that the supplied power adapter is the correct voltage for your country. If not, contact your distributor or, if purchased in the United States, Samson Technical Support at 1-800-372-6766.

2. Physically place the AR300 receiver next to your mixer. The general rule of thumb is to maintain "line of sight" between the receiver and transmitter so that the person using the transmitter can see the receiver.

3. Extend the AR300 antennas and spread the tips horizontally outwards at least 5 inches.

4. Make sure the Power On-Off switch in your AX300 transmitter is set to "Off" and that the MUTE is also set to "ON". Pull back gently on the AX300 battery cover at the ribbing and pry it upwards to remove it. Please use care when opening this cover as undue force can damage it. Install a fresh AA alkaline battery in the battery compartment, being sure to observe the polarity markings. Then carefully replace the battery cover and gently press down on it until it clicks. Momentarily turn on the power to the transmitter by sliding its Power On-Off switch in the direction of the arrow; the "Power/Battery" LED will flash if the battery is sufficiently strong (if it lights steadily, the battery has less than 2 hours of power remaining and should be replaced). Once battery strength is verified, turn the transmitter off again and place it aside for now.

5. With the Power switch on the AR300 set to the "Off" position, connect the included power adapter. Turn the AR300 on momentarily to confirm that the unit is receiving power. You'll see the LCD display light up. Then turn the AR300 power off.

Setting Up Your AirLine Synth System

6. Make the physical cable connection between the AR300 output jack and an audio input of your mixer. Leave your mixer and power amplifier off at this time.

7. Turn the Level knob on the AR300 completely counterclockwise, then set its Power switch up to turn it on. The LCD display light will illuminate.

8. Now to set the channel, press and hold the EDIT control until the display reads CH SCAN. Next, the AR300 will automatically find the clearest channel and you will see it in the Channel number of the display just before the IR SET will begin.

9. Once you see the IR SET flashing in the LCD display, hold the transmitter, with the bottom facing towards the AR300, approximately 6 inches away from the receiver and turn the AX300 power switch on. The AR300 will transmit the channel number to AX300 over infrared light and you will see the corresponding absolute channel number in the transmitter LCD.

10. The RF Meter on the AR300 receiver should now be active, indicating that it is receiving valid RF signal and is placed and positioned correctly.

11. Now it's time to set the audio levels. Turn on your mixer and/or amplifier but keep its volume all the way down. Plug the AX300 into the included Samson Q7 or any dynamic microphone. Begin speaking or singing at a normal performance level while observing the AR300 AF Meter. If all the bars are lit, indicating a Peak condition, even with the AR300 Level control fully counterclockwise, turn the Gain control down. If the AF Meter bars are showing a weak level, slowly turn the AX300's Gain control clockwise to the point where the AF Meter reaches "0" during the very loudest passages, then back it off just slightly; this will ensure maximum signal to noise ratio. Now, raise the Level on the AR300. Finally, raise the level of your mixer and/or amplifier until the desired volume is reached.

Setting Up Your AirLine Synth System

12. Temporarily turn down the level of your mixer or amplifier and turn off the power to your transmitter, leaving the AR300 receiver on. Then restore the previously set level of your mixer or amplifier. With the transmitter off, the receiver output should be totally silent; if it is, skip ahead to the next step. If it isn't (that is, if you hear some noise), you may need to adjust the AR300 Squelch control. When the Squelch control is at its minimum setting, the AirLine Synth system always provides maximum range without dropout; however, depending upon the particular environment your system is used in, you may need to reduce that range somewhat in order to eliminate band noise when the AX300 transmitter is turned off. To do so, use the provided screwdriver to rotate the Squelch control completely counterclockwise (to the "Min" position), then slowly turn it clockwise until the noise disappears. If no noise is present at any position, leave it at its fully counterclockwise "Min" position (so as to have the greatest overall range available).

13. When first setting up your AirLine Synth system in a new environment, it's always a good idea to do a walkaround in order to make sure that coverage is provided for your entire performance area. Accordingly, turn down the level of your audio system and turn on both the transmitter and receiver. Then restore the level of your audio system and while speaking or singing at a normal performance level, walk through the entire area that will need to be covered. As you do so, observe the RF Meter on the AR300 receiver to make sure that it is close to reaching "75%", indicating that it is receiving sufficiently strong RF signal. Always try to minimize the distance between transmitter and receiver as much as possible so that the strongest possible signal is received from all planned transmission points. In certain environments, it may be desirable to angle the AR300's antennas differently from the vertical position.

If you have followed all the steps above and are experiencing difficulties, contact your local distributor or, if purchased in the United States, call Samson Technical Support (1-800-372-6766) between 9 AM and 5 PM EST.

AR300/AX300 Operation

Setting a Group and Channel Manually
The AR300 receiver contains 320 selectable channels for N and U band, and 71 selectable channels for E band. All channels are organized into a series of groups. Each group contains channels that are compatible for simultaneous use. When using multiple systems, each system should be assigned to the same group in order to maximize the number of compatible channels. Each group is designated with a letter, followed by the group channel number (0–9) which is displayed under the "GROUP" icon in the AR300 LCD display.

To the right of the Group and Group Channel number is the readout Absolute channel number. This three-digit Absolute Channel number corresponds to the exact channel from the entire channel plan. That Absolute Channel number is shown on the AX300 transmitter's LCD display.

The AX300 displays the Absolute Channel number in its LCD for a few seconds, and then the display shuts off to preserve battery power. You can also see the transmitters Absolute Channel number by switching the Mute on. In addition, the AX300 will also display the Absolute Channel number briefly when the power is shut off.

1. Press the EDIT control once and you will see the Group and Group Channel Number Flash.

2. Turn the EDIT controller and you will see the Group and Channel number change, and you will also see the Absolute Channel number change in sync.

3. If you prefer, you can choose the Absolute Channel. Simply press the EDIT control again until the Absolute Channel number flashes. Then, turn the EDIT controller and you will see the Absolute Channel number change. It changes in sync with the Group and Channel number.

4. Once you have the desired channel set on the AR300 you're ready to transmit the infrared channel data to the AX300. Have the transmitter ready in your hand with the Power switch set to off.

5. Double click the EDIT controller and you will see the display flash "IR SET" indicating that the AR300 is sending the channel information over infrared transmission.

6. Now, position the transmitter about 6-inches from the front of the AR300 with the AX300 IR receiver facing the AR300's LCD display and turn the power switch on.

You will now see the corresponding Absolute Channel in the AX300 LCD display indicating that the transmitter is matched to the receiver.

AR300/AX300 Operation

Operating In FREE Mode

You can tune in an exact frequency using the AR300's FREE mode. Once you are in FREE mode you can change the frequency by 25 kHz steps. For most situations, it's better to use the GROUP channel plan but if you application requires an exact frequency, follow these steps to operate in FREE mode.

1. Press the EDIT controller three times until the display's FREE icon turns on and Frequency number flashes.

2. Next, turn the EDIT controller until you reach the desired frequency number.

3. Once you have the desired frequency set on the AR300 you're ready to transmit the infrared channel data to the AX300. Have the transmitter ready in your hand with the Power switch set to off.

4. Double click the EDIT controller and you see the display flash "IR SET" indicating that the AX300 is sending the channel information over infrared transmission.

5. Now, position the transmitter about 6-inches from the front of the AR300 with the AX300 IR receiver facing the AR300's LCD display and turn the power on.

You will now see the corresponding Absolute Channel in the AX300 LCD display indicating that the transmitter is matched to the receiver.

If you want to see the Absolute channel while the AR300 is in Free Mode, simply turn the EDIT control and it will toggle between the exact Frequency and the Absolute Channel.

To exit FREE Mode, just press the EDIT controller switch and you will return to the Group and Absolute Channel fields. Once you are in the Group Channel or Absolute Channel field and you have selected your channel, double click the EDIT control to perform the IR set and lock in the channel. You can also use the Scan function to find a clear channel by pressing and holding the EDIT knob. If you do not perform an IR set or Channel Scan, the AR300 will return to Free Mode and the channel will be set to the previously selected frequency.

Specifications

SYSTEM SPECIFICATIONS

Channels	320 channels 25kHz Step (N and U Bands)
	71 channels 25kHz Step (E Band)
Operating Frequency	639.025–647 MHz
	798.025–806 MHz (not for use in the USA)
	863–865 MHz (not for use in the USA)
Frequency Type	F3E
Modulation Type	FM
Noise Reduction Type	Compander
Distance	100 meters line of sight
Audio Frequency Response	50Hz - 15KHz (+/- 3dB)
Dynamic Range	>100dB (IHF-A)

AR300 RECEIVER

Oscillation System	VCO
Type of Reception	Double superheterodyne / True Diversity
Intermediate Frequency	10.7MHz
Antenna	1/4 Wavelength Rod TNC Type UHF - Extendable
Antenna Filter	SAW Filter
Output	1/4-inch Line and XLR Line/Mic
LCD Display	47mm x 17mm Back Lighted Display (Frequency, Channel, Group, Absolute Channel, Anntena, AF, RF, Scan, IR Set)
Controls	EDIT Encoder/Button, Volume, Squelch
Operating Temperature	0°C - +50°C
Power Supply Voltage	AC Adatper 18V DC
Current Consumption	Less Than 150mA
Receiving Sensitivity	More than S/N 60dB at 21 dBuV input
Squelch Sensitivity	Adjustable
T.H.D	1% Max (@AF 1kHz, RF 56dBuV)
Audio Output Level	-3dBv @1% THD (Maximum +7dBv)
Audio Output Impedance	10k ohms
Dimensions (L x W x H)	220.7mm x 179.38mm x 44mm (8.7" x 7.1" x 1.73")
Weight	1.97 lb

Specifications are subject to change without notice.

Specifications

TRANSMITTER (AX300)

Oscillation Type	Crystal-controlled PLL frequency systhesized
Modulation Type	FM
Antenna	1/4 Wave Length Dipole Type
Input Impedance	290k ohms(ATT:0dB), 330k ohms(ATT:-15dB)
Maximum Input Level	-2dBv
Switches/Controls	POWER switch, MUTE switch, GAIN control
Display	CHANNEL (LCD), BATT (LED)
Interface	Infrared
Impedance	2.2k ohms
Battery	AA x 1
Current Consumption	Less than 120mA
Operating Voltage	1.2V-1.5V
Battery Life	10 hours @ 25ºC
Operating Temperature	0ºC - 50ºC
RF Output Power	10mW ERP
Frequency Stability	+/-15kHz
Spurious Ratio	1uW
Deviation	20kHz (with 1kHz input), 40kHz max.
T.H.D.	> 2% max (@1kHz, dev. 20kHz) Typical THD less than 1%
Dimentions (L x W x H)	113.95mm x 29.8xx x40.2mm (4.5" x 1.17" x 1.6")
Weight	.108 lb

Specifications are subject to change without notice.