

Engineered Sound

ESW-T211 UHF UniPak™ Transmitter

Installation and Operation



Introduction

Audio-Technica Engineered Sound® wireless systems are offered as separate receiver and transmitter units, rather than in predetermined combinations, for greatest system flexibility. Operating details for Engineered Sound receivers and overall system operation are included with each receiver.

Engineered Sound receivers feature a sophisticated Tone Lock™ tone squelch system that opens only when an Engineered Sound transmitter is detected, reducing the possibility of interference. As a result, Engineered Sound transmitters and receivers must be used together and should not be used with components from other Audio-Technica wireless systems, or with those of other manufacturers.

Please note that in multiple-system applications there must be a transmitter-receiver pair set to a separate frequency for each input desired (only one transmitter at a time for each receiver). Because the wireless frequencies are on UHF TV frequencies, only certain wireless frequencies may be useable in a particular geographic area. Also, only certain of the available operating frequencies may be used together. (Suggestions for multiple-system frequency grouping will be found on pages 10-11.)

Notice to individuals *with implanted cardiac pacemakers or AICD devices:*

Any source of RF (radio frequency) energy *may* interfere with normal functioning of the implanted device. All wireless microphones have low-power transmitters (less than 0.05 watts output) which are unlikely to cause difficulty, especially if they are at least a few inches away. However, since a "body-pack" mic transmitter typically is placed against the body, we suggest attaching it at the belt, rather than in a shirt pocket where it may be immediately adjacent to the medical device. Note also that *any medical-device disruption will cease when the RF transmitting source is turned off*. Please contact your physician or medical-device provider if you have any questions, or experience any problems with the use of this or any other RF equipment.

CAUTION! The circuits inside the receiver and transmitter have been precisely adjusted for optimum performance and compliance with federal regulations. Do not attempt to open the receiver or transmitter. To do so will void the warranty, and may cause improper operation.

Transmitter Setup

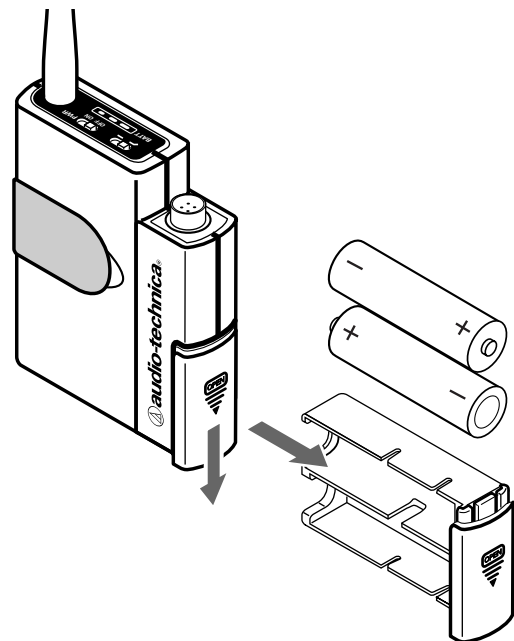
Battery Selection and Installation

The transmitter uses two 1.5V AA batteries, not included. Alkaline type is recommended. Always replace both batteries. ***Make certain the transmitter power switch is turned Off before replacing batteries.***

Battery Installation

1. Slide down the battery latching cover and pull out the battery drawer as shown in Figure A. (A screwdriver for adjusting operating frequency is stored on the back of the drawer.)

Fig. A



2. **Observe correct polarity as marked inside the battery compartment** and carefully insert two fresh 1.5V AA alkaline batteries. Because there is some variation in actual battery dimensions, make certain the batteries are **fully** seated in the battery compartment.

3. Carefully insert the battery drawer fully, **but do not force the drawer in**. Then slide the cover up to latch the drawer.

Battery Condition Indicator

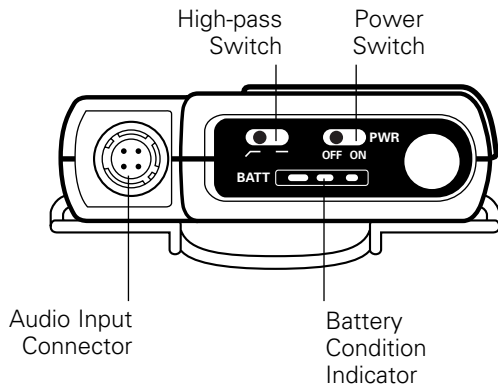
After the batteries are installed, turn the power on. The red battery condition indicator LED on the user control panel should flash momentarily and the green indicator should come on. If this does not happen, the batteries are installed incorrectly or they are dead. If the yellow or red indicator stays on, the battery voltage is low and the batteries should be replaced. If this happens during use, replace the batteries immediately to ensure continued operation.

Transmitter Input Connection

Connect an audio input device (microphone or guitar cable) to the audio input connector beside the user control panel (Fig. B).

A number of Audio-Technica professional microphones and cables are available separately, pre-terminated with a UniPak™ input connector (see “Transmitter Accessories” on page 9).

Fig. B
User Control Panel



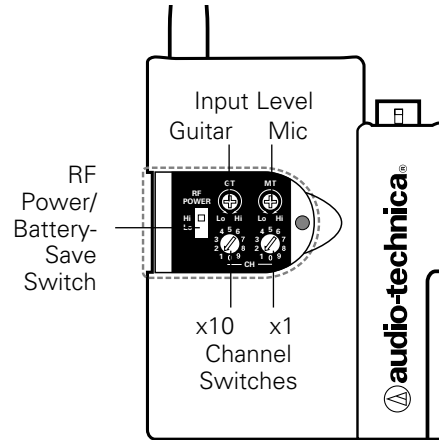
Transmitter Controls

(Refer to Fig. B, User Control Panel)

POWER SWITCH: The Power switch controls the entire transmitter. Its handle is designed to be felt and activated easily even through clothing or other garments. There is about a half-second delay after transmitter turn-on before the receiver's Tone Lock squelch un-mutes.

HIGH-PASS SWITCH: The ESW-T211 offers an audio high-pass switch which reduces low frequencies, when desired. It affects only the microphone input and is recessed to avoid accidental activation. Use this switch to reduce pickup of low-frequency noise caused by clothing and/or user movement.

Fig. C
Setup Control Panel



(Refer to Fig. C, Setup Control Panel)

INPUT TRIMMERS: These controls permit adjustment of Mic Level (MT) and Guitar Level (GT) to match a wide range of input devices, as described in a following section. The trimmer **not** in use should be set to minimum.

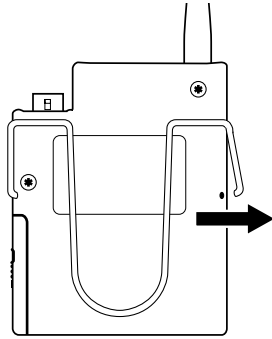
CHANNEL SWITCHES: The left channel selector switch corresponds to the receiver's left-column channel display number (tens); the right switch corresponds to the receiver's right-column channel display number (units). Always turn the transmitter off when changing frequencies.

RF POWER / BATTERY-SAVE SWITCH: As supplied, the switch is set in the "Hi" position for maximum range. Switching to the "Lo" position increases battery life somewhat by reducing power. (Note: Effective range may decrease when the switch is set at the Lo position.)

Mounting Clips

The ESW-T211 is supplied with two mounting clips for attachment to different types/shapes of objects. Attach the clips by springing their ends into the two holes on the sides of the transmitter case (Fig. D). The clips may be installed with the case positioned either "up" or "down," depending upon which is preferred for the application.

Fig. D

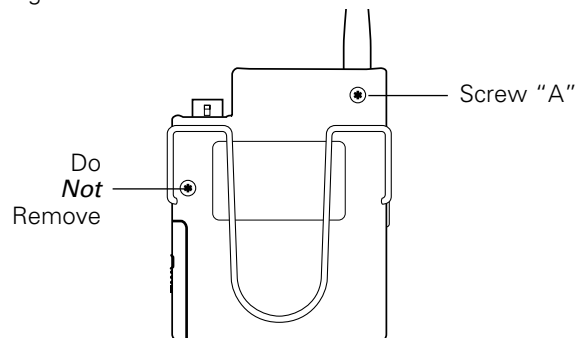


Transmitter Antenna

The ESW-T211 features a field-replaceable antenna, in the unlikely event that it becomes damaged. Use only an original Audio-Technica replacement part, available from the Audio-Technica service department.

1. Referring to Figure E, fully unscrew only screw "A" and remove it. Do **not** remove the other case screw.
2. Pull the broken antenna straight out of the transmitter case, without twisting it.
3. **Carefully** insert the replacement antenna, without twisting it, and without damaging the PC board trace. Look in the open hole "A" to assure that the antenna is fully seated.
4. Reinstall screw "A," tightening only until it is snug.

Fig. E



System Operation

Turn down the mixer/amplifier level before starting up the wireless system.

Switch on the receiver. Do **not** switch on the transmitter yet.

Receiver On...

The Channel Designator Display will light. If any of the RF LEDs light up at this point, there may be RF interference in the area. If this occurs, select another frequency using the front-panel channel selectors. While holding in the "Set" button, press the "Up" or "Down" button to access the desired frequency; then release the Set button to select the channel.

Transmitter On...

Before turning on the transmitter, use the provided screwdriver to set the transmitter channel selector switches (Fig. C) to the same numbers as those displayed on the receiver. Always turn the transmitter off when changing frequencies. When the transmitter is switched on and in normal operation, the receiver's RF signal level indicators will light up from left to right. For optimum performance at least four, and preferably five, of the signal strength indicators should light up when the transmitter is switched on. One of the Tuner LEDs (A or B) also will light up when the transmitter is on, indicating that its signal has been received and the receiver's Tone Lock squelch circuit has opened.

Setting Levels

Although Engineered Sound receivers require no level adjustment, correct adjustment of transmitter audio input and mixer/amplifier input and output levels is important for optimum system performance.

Transmitter Input Levels

Input trimmer controls in the UniPak transmitter (Fig. C) will enable you to use microphones or instruments with different output levels.

1. Set both the transmitter Mic Level (MT) and Guitar Level (GT) controls to their full counter-clockwise position (minimum). (The level control not being used should always be set to minimum.)
2. Plug the mic or instrument into the transmitter and power up the system.
3. **For MIC:** Make an initial adjustment of the mixer's level controls that will allow audio through the system as you increase the transmitter's Mic Level.

For INSTRUMENT: Make an initial adjustment of the instrument amplifier input level control that will allow audio through the system as you increase the transmitter's Guitar Level.

4. **For MIC:** While speaking/singing into the microphone at typically-loud levels, turn up the transmitter's Mic Level (MT) control until the maximum audio output of the mic lights about three or four green LED segments on the receiver's AF Level indicator.

For INSTRUMENT: While playing the instrument at typically-loud levels, turn up the transmitter's Guitar Level (GT) control until the maximum audio output of the instrument lights about three or four green LED segments on the receiver's AF Level indicator.

NOTE: Do not set the transmitter level too high (as indicated by lighting of the red LED) – doing so will cause the system to overload and distort.

5. **For MIC:** Next, while again speaking/singing into the microphone at typically-loud levels, adjust the mixer's input trim control so the highest sound pressure level going into the microphone causes no input overload in the mixer, and yet permits the mixer's channel and output level controls to operate in their "normal" range (not set too high or too low).

For INSTRUMENT: Next, while again playing the instrument at typically-loud levels, adjust the amplifier's input control so the highest signal level causes no overload in the instrument amplifier.

CAUTION! The small trimmer controls are delicate; use only a small screwdriver or alignment tool with a maximum $\frac{3}{32}$ "-wide blade. Do not force the trimmers beyond their normal 260° range of rotation.

RF Interference

Please note that wireless frequencies are shared with other radio services. According to Federal Communications Commission regulations, "Wireless microphone operations are unprotected from interference from other licensed operations in the band. If any interference is received by any Government or non-Government operation, the wireless microphone must cease operation..."

If you need assistance with operation or frequency selection, please contact your dealer or the Audio-Technica professional division. Extensive wireless information also is available on the Audio-Technica Web site at www.audio-technica.com.

Tips To Obtain The Best Results

- Use only fresh alkaline batteries. Do not use "general purpose" (carbon-zinc) batteries.
- The transmitter and the receiver should be as close together as conveniently possible, but no closer together than three feet. Maintain line-of-sight between them whenever possible.
- Each transmitter/receiver pair must be set to the same channel number.
- A single receiver cannot receive signals from two transmitters at the same time.
- You need to change channels 1) when a strong interference signal is received, 2) when the channel breaks down, or 3) during multiple-system operation in order to select an interference-free channel.
- The "MT" or "GT" input control not in use should be set to minimum.
- Turn the transmitter off when not in use. Remove the batteries if the transmitter is not to be used for a period of time.

Specifications†

OVERALL SYSTEM

Operating Frequency	UHF band, 728.125 to 740.500 MHz
Number of Channels	100 total
Frequency Stability	±0.005%, Phase Lock Loop frequency control
Modulation Mode	FM
Normal Deviation	±5 kHz
Tone Squelch Frequency	32.768 kHz
Operating Range	300' typical
Operating Temperature Range	41° F (5° C) to 113° F (45° C)
Frequency Response	100 Hz to 15 kHz

ESW-T211 UNIPAK™ TRANSMITTER

RF Power Output	50 mW Max (Hi: 10 mW; Lo: 5 mW, typical)
Spurious Emissions	Under federal regulations
Input Connections	High impedance, low impedance, bias
Bias Voltage	5V, 5 mA Max
High-pass (low-freq. roll-off)	150 Hz, 6 dB per octave (mic input only)
Batteries	Two 1.5V AA type alkaline, not included
Current Consumption	Hi: 130 mA; Lo: 120 mA, typical
Battery Life	Hi: 12 hours; Lo: 14 hours, typical (depending on battery type and use pattern)
Dimensions	2.56" (65.0 mm) W x 6.57" (167.0 mm) H x 1.02" (26.0 mm) D
Net Weight (without batteries)	2.7 oz (75 grams)
Accessory Included	Alternate mounting clip

† In the interest of standards development, A.T.U.S. offers full details on its test methods to other industry professionals on request.

Transmitter Accessories

(All are terminated for use with the ESW-T211 UniPak transmitter.)

AT829cW	AT829 miniature cardioid condenser microphone only. Includes clothing clip and windscreen.
MT830cW	MT830R subminiature omnidirectional condenser microphone only. Includes clothing clip and windscreen.
MT830cW-TH	"Theater" model, same as MT830cW except beige color mic and cable for concealment.
AT831cW	AT831b miniature cardioid condenser microphone only. Includes clothing clip and windscreen.
AT851cW	AT851a surface-mount wide-range hemi-cardioid condenser microphone only.
AT857AMLcW	AT857AMLa 19" gooseneck cardioid microphone only. Mounts to $\frac{5}{16}$ "-27 thread. Includes windscreen.
AT889cW	Headworn noise-canceling condenser microphone only. Includes windscreen and cable clip.
ATM35cW	ATM35 high-intensity miniature cardioid condenser microphone only. Includes AT8418 clip-on instrument mount.
ATM73cW	ATM73a headworn cardioid condenser microphone only.
ATM75cW	ATM75 headworn cardioid condenser microphone only. Includes windscreens and cable clip.
PRO 8HEcW	PRO 8HEX headworn hypercardioid dynamic microphone. Includes windscreen and cable clip.
PRO 35xcW	PRO 35x cardioid condenser microphone only. Includes AT8418 clip-on instrument mount.
AT-GCW	Hi-Z instrument/guitar cable with $\frac{1}{4}$ " phone plug.
XLRW	Connecting cable for UniPak transmitter with an XLR-type input connector, for Lo-Z microphones with XLRM-type output terminations.

Engineered Sound® UHF Wireless Operating Frequencies

Frequency and Channel Designator List

Designator	Frequency (MHz)	TV Channel	Designator	Frequency (MHz)	TV Channel
00	728.125	57	50	734.375	58
01	728.250	57	51	734.500	58
02	728.375	57	52	734.625	58
03	728.500	57	53	734.750	58
04	728.625	57	54	734.875	58
05	728.750	57	55	735.000	58
06	728.875	57	56	735.125	58
07	729.000	57	57	735.250	58
08	729.125	57	58	735.375	58
09	729.250	57	59	735.500	58
10	729.375	57	60	735.625	58
11	729.500	57	61	735.750	58
12	729.625	57	62	735.875	58
13	729.750	57	63	736.000	58
14	729.875	57	64	736.125	58
15	730.000	57	65	736.250	58
16	730.125	57	66	736.375	58
17	730.250	57	67	736.500	58
18	730.375	57	68	736.625	58
19	730.500	57	69	736.750	58
20	730.625	57	70	736.875	58
21	730.750	57	71	737.000	58
22	730.875	57	72	737.125	58
23	731.000	57	73	737.250	58
24	731.125	57	74	737.375	58
25	731.250	57	75	737.500	58
26	731.375	57	76	737.625	58
27	731.500	57	77	737.750	58
28	731.625	57	78	737.875	58
29	731.750	57	79	738.000	58
30	731.875	57	80	738.125	58
31	732.000	57	81	738.250	58
32	732.125	57	82	738.375	58
33	732.250	57	83	738.500	58
34	732.375	57	84	738.625	58
35	732.500	57	85	738.750	58
36	732.625	57	86	738.875	58
37	732.750	57	87	739.000	58
38	732.875	57	88	739.125	58
39	733.000	57	89	739.250	58
40	733.125	57	90	739.375	58
41	733.250	57	91	739.500	58
42	733.375	57	92	739.625	58
43	733.500	57	93	739.750	58
44	733.625	57	94	739.875	58
45	733.750	57	95	740.000	59
46	733.875	57	96	740.125	59
47	734.000	58	97	740.250	59
48	734.125	58	98	740.375	59
49	734.250	58	99	740.500	59

Multi-channel Systems

Following are groupings of frequencies suggested for multi-channel wireless systems.

Group A: Channels 00, 02, 08, 15, 46, 50, 60 (or 62), 71, 76, 80, 93, 99 -or-

Group B: Channels 01, 03, 07, 25, 30, 41, 44, 56, 69, 76, 77, 86

For use where TV Channel 57 is operating:

Channels 50, 60 (or 62), 71, 76, 80, 93, 99

(from Group A) -or-

Channels 56, 69, 76, 77, 86 (from Group B)

For use where TV Channel 58 is operating:

Channels 00, 02, 08, 15, 46, 99 (from Group A) -or-

Channels 01, 03, 07, 25, 30, 41, 44 (from Group B)

For use where TV Channel 59 is operating:

Channels 00, 02, 08, 15, 46, 50, 60 (or 62), 71, 76,

80, 93 (from Group A) -or-

Channels 01, 03, 07, 25, 30, 41, 44, 56, 69, 76, 77,

86 (All of Group B)

For future reference, please record your system information here (the serial number appears inside the battery compartment):

Transmitter ESW-T211

Serial Number

One-Year Limited Warranty

Audio-Technica professional wireless systems purchased in the U.S.A. are warranted for one year from date of purchase by Audio-Technica U.S., Inc. (A.T.U.S.) to be free of defects in materials and workmanship. In event of such defect, product will be repaired promptly without charge or, at our option, replaced with a new product of equal or superior value if delivered to A.T.U.S. or an Authorized Service Center, prepaid, together with the sales slip or other proof of purchase date.

Prior approval from A.T.U.S. is required for return. This warranty excludes defects due to normal wear, abuse, shipping damage, or failure to use product in accordance with the instructions. This warranty is void in the event of unauthorized repair or modification, or removal or defacing of the product labeling.

For return approval and shipping information, contact the Service Dept., Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224.

Except to the extent precluded by applicable state law, **A.T.U.S. will have no liability for any consequential, incidental, or special damages; any warranty of merchantability or fitness for particular purpose expires when this warranty expires.**

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Outside the U.S.A., please contact your local dealer for warranty details.



audio-technica®

Audio-Technica U.S., Inc., 1221 Commerce Drive,
Stow, Ohio 44224 330/686-2600
www.audio-technica.com

P#2323-02490 P51249-B/W ©2000 Audio-Technica U.S., Inc.
Printed in Japan