Pro Series

Professional UHF Wireless Systems

PRO 451G UniPak™ System with Guitar Cable
PRO 451H UniPak™ System with Headworn Microphone
PRO 451L UniPak™ System with Lavalier Microphone
PRO 452 Handheld Dynamic Microphone System

Installation and Operation

audio-technica®

Installation and Operation

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

This device complies with INDUSTRY CANADA R.S.S. 210, en conformité avec IC: RSS-210/CNR210. Operation is subject to the following conditions: 1) This device may not cause harmful interference and 2) this device must accept any interference received, including interference which may cause undesired operation.

CAUTION! Electrical shock can result from removal of the receiver cover. Refer servicing to qualified service personnel. No user-serviceable parts inside. Do not expose to rain or moisture.

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.

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

Please read the cautionary notice on **back cover** before operating this or any other source of RF (radio frequency) energy.

Introduction

Thank you for choosing an Audio-Technica professional wireless system. You have joined thousands of other satisfied customers who have chosen our products because of their quality, performance and reliability. This wireless microphone system is the successful result of years of design and manufacturing experience.

Each professional wireless system includes a receiver and either a body-pack or a handheld transmitter on a specific crystal-controlled frequency.

The receiver features true diversity reception. Two antennas feed two completely independent RF sections on the same frequency; automatic logic circuitry continuously compares and selects the superior received signal, providing better sound quality and reducing the possibility of interference and dropouts.

The versatile UniPak™ body-pack transmitter has both low- and high-impedance inputs plus a bias connection, for use with dynamic and electret condenser microphones, as well as Hi-Z instrument pickups. Both the handheld and UniPak transmitters use internal 9-volt batteries and have Off/Standby/On switches, battery condition indicators, and battery-save switches.

Please note that in a multi-channel application, there must be a transmitter-receiver combination on a ***separate*** frequency for each input desired (only one transmitter for each receiver). Operating frequency information will be found on page 9.

Receiver Installation

Location

For best operation the receiver should be at least 3' above the ground and at least 3' away from a wall or metal surface to minimize reflections. The transmitter should also be kept at least 3' away from the receiver. For best performance, locate the receiver so its antennas are in direct line-of-sight to the transmitter's likely operating position.

Keep the antennas away from noise sources such as digital equipment, motors, automobiles and neon lights, as well as large metal objects.

Output Connection

The receiver provides unbalanced, aux-level output from a 1/4" phone jack; output cable is not included. Use a shielded audio cable with 1/4" phone plug to connect the receiver's AF Out jack to the mixer/amplifier's aux-level input.

Power Connection

Turn the receiver's volume control all the way down. Connect the included AC adapter to the DC power input on the back of receiver. (Note that the receiver has no power off/on switch. The receiver will be on whenever the AC adapter is connected and plugged into the AC outlet. Unplug the AC adapter from the AC outlet whenever the system is not in use – both for safety, and to conserve energy.)

Antennas

The antennas normally should be positioned in the shape of a "V" (45° from vertical) for best reception (Fig. A).

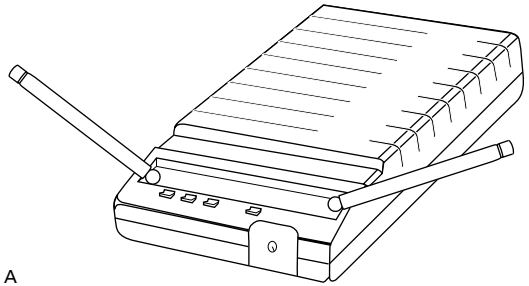


Fig. A

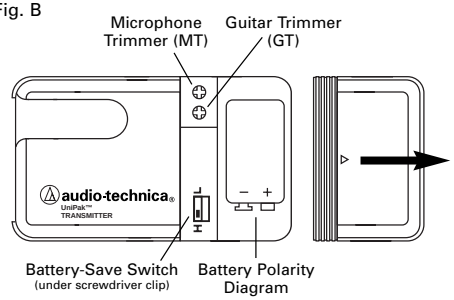
Transmitter Setup

Battery Selection
An alkaline 9-volt battery is recommended.

UniPak™ Transmitter Battery Installation
Make certain the power switch on the bottom of transmitter is in the "Off" position.

Slide off the battery cover as shown in Figure B.

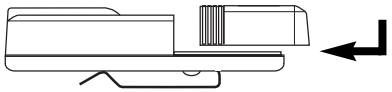
Fig. B



Carefully insert a fresh 9-volt alkaline battery, observing correct polarity as marked inside the battery compartment. The transmitter housing is designed to prevent incorrect installation of the battery. ***Do not force the battery in.***

Replace the battery cover (Fig. C).

Fig. C



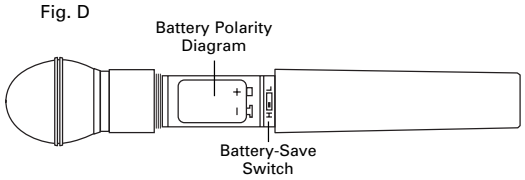
Move the power switch to "On" and make certain the red battery condition indicator is strongly illuminated.

Return the power switch to the "Off" position.

Handheld Transmitter Battery Installation
Make certain the power switch on the bottom of transmitter is in the "Off" position.

While holding the upper part of the transmitter body just below the ball-screen, unscrew the lower body and slide it downward to expose the battery compartment (Fig. D). *Do not attempt to pull the lower body farther down, or to gain access to the electronics.*

Fig. D



Lift the white "battery keeper" arm until it sticks straight out from the mic body (no higher). Then carefully insert a fresh 9-volt alkaline battery, observing correct polarity as marked inside the battery compartment. The transmitter housing is designed to prevent incorrect installation of the battery. ***Do not force the battery in.***

Move the white arm down until it presses on the battery, then slide the lower body portion back up until it covers the battery and engages the threads of the upper body. Screw the body back together; do not overtighten.

Move the power switch on the bottom of transmitter to "On" and make certain the red battery condition indicator is strongly illuminated.

Return the power switch to the "Off" position.

Battery Condition Indicator
The red battery condition indicator (Fig. E/F) should light strongly with a fresh battery. As the battery weakens, the indicator will grow dimmer. When the indicator becomes very dim or goes out, there is little life left in the battery. Replace it at once for continued operation of the transmitter.

All transmitters feature battery-save switches (Fig. B/D). As supplied, the switch is set in the High position for maximum range. Switching to the Low position increases battery life by reducing power. (Note: Effective range decreases when the switch is set in the Low position.)

UniPak™ Transmitter Input Connection
Connect an audio input device (microphone or guitar cable) to the input connector on the bottom of the transmitter.

Transmitting Antenna
The UniPak transmitter includes a permanently-attached flexible antenna. For best results, allow the antenna to hang freely and full length from the bottom of the transmitter. If the received signal is marginal, experiment with different transmitter positions on your body or instrument; or try repositioning the receiver. *Do not attempt to remove, replace or change the length of the transmitting antenna.*

Fig. E

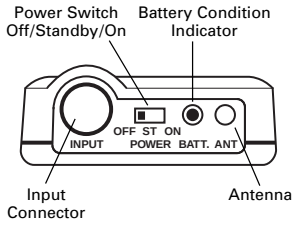
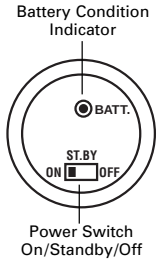


Fig. F



System Operation

Check the frequency of the system against the chart on page 9 to ensure you have a proper frequency for your area. Operating frequency is shown on the back panel of the receiver and on the transmitter.

Turn down the volume control of the receiver as well as input controls on the mixer/amplifier. Do ***not*** switch on the transmitter yet.

Receiver on...
Plug the AC adapter into an AC power source. The red power indicator will light.

Transmitter on...
The transmitters have a 3-position power switch. When the switch is set to either "Standby" (ST or ST.BY) or "On," the green diversity indicator LEDs (A or B) on the receiver will light. In "Standby," the transmitter produces RF with no audio signal. When the switch is "On," the transmitter produces both RF and audio. Maximum audio input to the transmitter will cause the receiver's yellow AF Peak indicator to light.

Receiver Squelch
The squelch control on the back panel of the receiver is preset at the factory, but can be adjusted if you must use the system in a high RF interference area. If there is audio output from the receiver when ***your*** transmitter is ***off,*** adjust the squelch control so the system will receive the signal from ***your*** transmitter but "squelch" or eliminate the unwanted background RF noise. This adjustment can cause a reduction in useable range of the wireless transmitter, so set the control to the ***lowest*** position which reliably mutes the unwanted RF signals.

Input Level Adjustment
Input trimmer controls in the transmitters enable you to use microphones or guitars with different sensitivities, or to adjust for different acoustic levels.

CAUTION!
The small trimmer controls are ***delicate****; use only the supplied screwdriver.*
Do ***not*** *force the trimmers beyond their normal 260° range of rotation.*

Return the screwdriver to its storage clip when not in use.

Adjusting Input Levels-UniPak Transmitter
Slide the battery cover off the top part of transmitter and remove the screwdriver from its clip (Fig. B). Gently turn the "MT" (mic trimmer) and "GT" (guitar trimmer) controls to their full counter-clockwise positions.

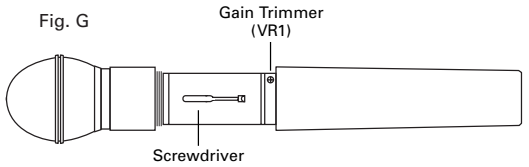
• Microphone: Adjusting input level
While speaking/singing into the microphone at typically-loud levels, carefully turn the MT control clockwise while watching the receiver's AF Peak indicator. Increase the MT control setting until the AF Peak indicator lights. This indicates that maximum transmitter modulation without significant distortion has been reached. ***(When using a guitar, return the MT control setting to minimum.)***

• Guitar/Instrument: Adjusting input level
While playing at typically-loud levels, carefully turn the GT control clockwise while watching the receiver's AF Peak indicator. Increase the GT control setting until the AF Peak indicator lights. This indicates that maximum transmitter modulation without significant distortion has been reached. ***(When using a microphone, return the GT control setting to minimum.)***

After adjusting input levels, return the screwdriver to its clip and reinstall the battery cover. No further transmitter gain adjustments should be needed, as long as the input device and the acoustic input level are not changed.

Adjusting Input Level-Handheld Transmitter
Unscrew the lower body cover and slide it downward, exposing the screwdriver and gain trimmer (Fig. G). Remove the screwdriver and ***gently*** turn the gain trimmer control to its full counter-clockwise position.

Fig. G



While speaking/singing into the microphone at typically-loud levels, carefully turn the trimmer control clockwise while watching the receiver's AF Peak indicator. Increase the control setting until the AF Peak indicator lights. This indicates that maximum transmitter modulation without significant distortion has been reached.

Return the screwdriver to its clip and close and secure the lower body. (Make certain that the white "battery keeper" arm is inside the body.) No further transmitter gain adjustments should be needed, as long as the acoustic input does not change significantly.

Ten Tips To Obtain The Best Results

1. Use only fresh alkaline batteries. Do not use "general purpose" (carbon-zinc) batteries.
2. Position the receiver so that it has the fewest possible obstructions between it and the normal location of the transmitter. Line-of-sight is best.
3. Do not place the receiver antennas within three feet of another receiver or antenna.
4. The receiver antennas should be kept away from any metal.
5. A receiver cannot receive signals from two transmitters at the same time.
6. In the UniPak transmitter, the "MT" or "GT" input control *not* in use should be set to *minimum.*
7. If the volume control of the receiver is set too high, it may over-drive the input of the mixer/amplifier, causing distortion. Conversely, if the receiver output is set too low, the overall signal-to-noise ratio of the system may be reduced. Adjust the output level of the receiver so the highest sound pressure level going into the microphone (or the loudest instrument playing level) causes no input overload in the mixer, and yet permits the mixer level controls to operate in their "normal" range (not set too high or too low). This provides the optimum signal-to-noise for the entire system.
8. In multiple-system applications, set the battery-save switches on Low if possible, to reduce the chance of intermodulation problems.
9. Turn the transmitter off when not in use. Remove the battery if the transmitter is not to be used for a period of time.
10. Unplug the AC adapter from the AC outlet when the system is not in use.

Wireless Operating Frequencies

Frequency Selection

Each transmitter/receiver system operates on a single factory-aligned, crystal-controlled frequency. Available frequencies are shown in the chart on the following page. Frequencies in the 792-806 MHz band are useable in the U.S. and Canada; 944-952 MHz frequencies are approved for use only in the U.S.

Because the 792-806 MHz frequencies are shared with TV broadcasting, frequency selection is partially dependent upon which TV broadcast channels are in operation ***where the wireless system is to be used.***

Operating frequency is specified by a three-character code, such as "67V," in addition to the actual frequency in MHz. The frequency of each transmitter appears on a label on the outside of the unit. The frequency of each receiver appears on a label on the back of the unit and the frequency of each system appears on the outer carton. For future reference, please record them in the space provided below.

RF Interference

If you encounter receiving interference (from other than an operating TV station), often it can be eliminated by adjusting the receiver's squelch control, as described on page 6.

Please note that wireless frequencies are shared with other radio services. According to applicable regulations,"Wireless microphone operations are unprotected from interference from other licensed operations within 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 A-T professional division.

Extensive wireless information also is available on the A-T Web site at www.audio-technica.com.

For future reference, please record your system information here (the serial numbers appear inside the battery compartment of each transmitter, and on the bottom of each receiver):

Operating Frequency

Freq. Code ____ ____ ____ Frequency ___ ___ ___ • ___ ___ ___ MHz

Receiver

Model _____ Serial Number ___ ___ ___ ___ ___ ___ ___

Transmitter

Model _____ Serial Number ___ ___ ___ ___ ___ ___ ___

System Operating Frequencies

UHF TV Band (792-806 MHz)	**Freq. Code**	**Freq. (MHz)**
• For use only where there is no TV Channel 67:	67R	792.650
	67V	793.000
• For use only where there is no TV Channel 68:	68F	795.600
	68K	796.650
	68L	797.000
• For use only where there is no TV Channel 69:	69F	801.700
	69K	802.700
	69Q	804.100
	69R	804.850
	69S	805.200

900 MHz Band (944-952 MHz)	**Freq. Code**	**Freq. (MHz)**
	44C	944.100
	44Q	944.700
	45A	945.000
	46E	946.200
	47C	947.100
	48N	948.600
	49S	949.800
	50L	950.500
	51M	951.550
	51U	951.900

Aside from the TV channel restrictions above, multi-channel systems may combine up to all 20 frequencies. Due to the unique conditions encountered in any complex system, the following guidelines may be helpful:

- Use the Low-power transmitter setting to reduce the possibility of interference.
- Maintain the maximum possible spacing between transmitters and receivers, and between transmitters.
- PRO 400 Series operating frequencies have been selected for optimum compatibility. However, ***all*** sources of 800-900 MHz RF energy (other manufacturers' wireless systems, 900 MHz cordless phones, etc.) can affect the overall performance of the multi-mic system in ways which cannot be predicted. Only on-site trials with ***all*** RF equipment in operation can determine the overall system functionality.

Specifications

Overall System

Operating Frequency	UHF band, 792 MHz to 806 MHz (U.S. and Canada); 944 MHz to 952 MHz (U.S. only)
Frequency Stability	± 0.005%
Modulation Mode	FM
Maximum Deviation	±15 kHz
Operating Range	200' minimum
Operating Temperature Range	40° F (4° C) to 110° F (43° C)
Frequency Response	100 Hz to 15 kHz

Receiver

Receiving System	Dual independent receivers, automatic-switching diversity reception
Image Rejection	45 dB minimum
Signal-to-noise Ratio	87 dB at 10 kHz deviation (IEC-weighted), maximum modulation 15 kHz
Total Harmonic Distortion	≤1% (10 kHz deviation at 1 kHz)
Sensitivity	≤20 µV for 60 dB S/N (IEC-weighted)
Audio Output	350 mV (1 kHz modulation, 10 kHz deviation, 100k ohm load)
Power Supply	12-18V DC, 140 mA
Dimensions	4.33" (110.0 mm) W x 1.38" (35.1 mm) H x 8.27" (210.1 mm) D
Net Weight	13.7 oz (390 grams)
Accessory Included	AD1205A AC adapter

UniPak™ Transmitter

RF Power Output	50 mW Max
Spurious Emissions	Under federal regulations
Dynamic Range	≥90 dB
Input Connections	High impedance, low impedance, bias
Battery	9V (NEDA type 1604) alkaline, not included
Current Consumption	50 mA typical
Battery Life	Approximately 8 hours in High position Approximately 10 hours in Low position
Dimensions	2.56" (65.0 mm) W x 4.33" (110.0 mm) H x 1.00" (25.4 mm) D
Net Weight (without battery)	3.2 oz (90 grams)

Handheld Transmitter

RF Power Output	50 mW Max
Spurious Emissions	Under federal regulations
Dynamic Range	≥90 dB
Microphone Element	Dynamic unidirectional
Battery	9V (NEDA type 1604) alkaline, not included
Current Consumption	50 mA typical
Battery Life	Approximately 8 hours in High position Approximately 10 hours in Low position
Dimensions	9.53" (242.0 mm) long, 2.13" (54.0 mm) diameter
Net Weight (without battery)	12.3 oz (350 grams)
Accessory Included	AT8431 stand clamp

Optional System Accessories

Wireless Essentials™ Microphones and Cables

All Wireless Essentials accessories are terminated for use with ATW-T51 and other UniPak™ transmitters.

AT829cW	Miniature cardioid condenser lavalier microphone. Includes clothing clip and windscreen.
MT830cW	Subminiature omnidirectional condenser lavalier microphone. Includes clothing clip and windscreen.
MT830cW-TH	"Theater" model, same as MT830cW except beige color mic and cable for concealment.
AT831cW	Miniature cardioid condenser lavalier microphone. Includes clothing clip and windscreen. *Provided with PRO 451L system.*
AT851cW	Surface-mount wide-range hemi-cardioid condenser microphone.
AT857AMLcW	19" gooseneck cardioid microphone. Mounts to 5/8"-27 thread. Includes windscreen.
ATM35cW	Cardioid condenser instrument microphone. Includes AT8418 clip-on instrument mount.
ATM73cW	Headworn cardioid condenser microphone. Includes windscreen.
ATM75cW	Headworn cardioid condenser microphone. Includes windscreens and cable clip.
PRO 8HEcW	Headworn hypercardioid dynamic microphone. Includes windscreen and cable clip. *Provided with PRO 451H system.*
PRO 35xcW	Cardioid condenser instrument microphone. Includes AT8418 clip-on instrument mount.
AT-GCW	Hi-Z instrument/guitar cable with 1/4" phone plug. *Provided with PRO 451G system.*
XLRW	Connecting cable for UniPak transmitter with an XLRF-type input connector, for Lo-Z microphones with XLRM-type output terminations.

Other Accessories

AT8114	Foam windscreen for handheld transmitter.
AT8141	Water-resistant pouch for UniPak transmitter.
AT8390	Shielded audio cable with 1/4" to 1/4" phone plugs. Available in a variety of lengths. (Also available with one straight and one 90° phone plug as the AT8316.)
AT8431	Stand clamp for handheld transmitter, 5/8"-27 threads.
AT8633	Rack-mount adapter kit allows mounting one or two PRO-R4 receivers in a single 19" rack space.
ATW-VP10	Vinyl pouch with belt clip to hold UniPak transmitter.

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.

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.

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