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Audio-Technica System 10 PRO 2.4GHz Digital Wireless Microphone System

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The ATW-1312/L System 10 PRO 2.4GHz digital wireless microphone system with handheld and body-pack transmitters.

Audio-Technica was established in the early '60s; the company's products were stereo phono cartridges. The product line would expand to include tone arms, and, in 1969, microcassette recorders. In 1972, ten years after the start of A-T in Japan, Audio-Technica US, Inc. was established, headquartered in Akron, Ohio. In 1974, A-T developed AT-700 stereo headphones. In 1985, A-T's UniPoint installed sound microphone was introduced and, in '86, the company's first wireless microphone system. It was around this time A-T expanded its product offerings to focus on microphones as well as headphones. In 2012, Audio-Technica celebrated its 50th anniversary. In the years between, A-T expanded its microphone line, provided mics to a number of Olympic Games (from 1996 to

present), and developed wireless technologies (SpectraPulse) to highlight a few milestones.

There are only a handful of pro audio manufacturers that cover the spectrum of input to output—producing microphones, wireless systems, and headphones. Audio-Technica is on that short list.

2.4GHz ISM band—TV-free zone

The ISM (industrial, scientific, and medical) band does not require licensing to operate equipment in this frequency range and is far outside of the UHF bands (TV bands) where the majority of wireless microphone systems operate.

Until relatively recently, having a wireless mic system that operated in the 2.4GHz range was viewed as

interesting but not a serious contender, due to perceived shortcomings. This was before the FCC decided to auction off some of the available UHF spectrum, and manufacturers were challenged to work with what spectrum remained and/or look to other avenues to develop wireless technology.

While some issues with ISM band wireless systems could be filed under common misconceptions surrounding the technology, Audio-Technica has done an admirable job in addressing other perceived problems. The System 10 PRO wireless mic system provides a unique approach to wireless system implementation.

System 10 Pro is available in eight different versions, all based around the ATW-RC13 rack-mount receiver chassis and ATW-RU13 receiver unit. The differences are in the quantity of receivers per system (one or two), the type of transmitters per system (handheld and/or body-pack), and the inclusion of an MT830cW lavalier microphone (or two). The system's estimated street prices range from \$429, for a single receiver and an ATW-T1001 UniPak body pack transmitter, to \$899 for two receivers and two transmitters outfitted with lav mics.

The system I received for review was the ATW-1312/L, which included the receiver chassis, two receiver units, an ATW-T1002 handheld dynamic microphone transmitter, and the UniPak transmitter with an MT830cW omnidirectional lavalier mic. The estimated street price for the system is \$849. Not bad for two channels

of wireless, ready to go.

System 10 distinguishes itself in a number of ways: The receiver units are, in fact, modules that fit into a docking port in the half-rack-width chassis. Each chassis accepts two receiver units. Two short antennae screw on directly to each receiver unit via a small, threaded, gold-plated coaxial connector. The antennae are hinged so that, once they are securely attached to the receiver module, you can flip them up into the optimal splayed position. The chassis comprises a power switch on the left side, and two receiver bays that flank a small system ID display. Underneath the display are two pairs of switches for “system ID select” and “system pairing” for each channel respectively. The display indicates RF signal level, system ID, transmitter battery gauge, and link. Underneath each receiver bay is an eject button that releases the receiver from the dock. Once the receiver is removed, a hinged flap comes down to close off and protect the opening.

The chassis provides the channel designation, so that receiver modules can be interchanged (out of the box, 1 will always be the left channel, and 2 will be the right channel). Interestingly, on the rear of the chassis, the channels are labeled “A” and “B,” which is easy enough to extrapolate. It’s probably done for when systems of greater than two channels are used, in which case you would manually set the additional channels by toggling through the ID numbers (0 through 9), using the ID button on the front of the receiver chassis until you’ve selected the appropriate number for your channel count. While the front ID numbers would range from 0 to 9, in a larger system, each receiver chassis would have an “A” and “B” channel. Also provided is the AT8690RU 13 holder, which allows mounting to a wall or other structures. The receiver slips in—or out—of the holder, for semi-permanent (or permanent) remote installation.

The rear of the chassis comprises



The display indicates channel, RF level, battery level, pairing, and audio present. The buttons are for ID selection and pairing.



A half-rack chassis holds two receiver units.



System 10 Pro I/O includes balanced and unbalanced outputs, RJ45 connectors for external receiver unit connection, and RJ12 connectors for system linking.

two sets of I/O and controls (one for each channel), including RJ45 connectors for remote-mounting of the receiver modules, using Ethernet cable, ground lift switch, volume control, and unbalanced 1/4" and balanced XLR outputs. Also on the rear panel are in and out link RJ12 connectors for linking additional chassis together, and a 12V DC input for powering the system.

Audio-Technica supplies a 1' RJ12 link cable with each system. The wall wart power supply is designed to take up minimal space when plugged into a power strip. I'm not a big fan of wall warts, but this one doesn't take up an excessive amount of AC outlet real estate. There is a ferrite choke on the other end of the power cable to help suppress EMI/RFI noise.



The chassis with receiver unit removed.

Saving real estate

Since the chassis is one half-rack in width, the system includes rack ears (one short, one long), for rack-mounting a single chassis, and a connector plate for attaching two chassis together. Combining two systems gives you four channels of wireless in a single rack space. Talk about a space saver.

The removable ATW-RU13 receiver unit comprises the coaxial antenna screw mount connectors on the front, and a 1/4" -20 thread screw mount for mounting to a tripod or other device, LED status indicator, and an RJ45 connector for using the receiver module remote from the chassis.

2.4GHz cons vs. A-T solutions

It is a fact that 2.4GHz systems do not exhibit the operating range as compared to UHF systems; however, in most practical applications, distance will not be an issue. Under normal circumstances, distances of up to 100' between the transmitter and receiver should be OK.

Con: Line of sight between transmitter and receiver antennae is required for optimal performance for

2.4GHz systems. And, transmission line loss (signal lost over long antenna cable runs) is greater in 2.4GHz systems compared to UHF systems.

A-T's solution: Here Audio-Technica has hit a couple of birds with one stone. While UHF wireless systems can function well with remote antennae, it's not quite as simple for systems that operate in the

2.4GHz range. Long antenna runs can result in degraded signal quality. So, with System 10 PRO, A-T just provided the ability to remote the entire receiver via Ethernet cable...up to 100m away! Remote mounting can be accomplished in a number of ways. The 1/4"-20 threaded insert allows mounting the receiver unit to a camera tripod, and third-party adapters can be had that will allow mounting to a mic stand. The holder can be attached to a wall, as mentioned, or a set piece, or anywhere on the stage or performance area that provides line of sight between the receiver unit and the transmitter.

Con: There is less spectrum, and, as a result, there are fewer channels available in the 2.4GHz band (about 83MHz and compared to about 230MHz for UHF). And the ISM band is chock-full with other devices (such as consumer and commercial Wi-Fi, Bluetooth, microwave oven, and baby-monitoring devices) operating in the same band.

A-T Solution: System 10 Pro makes the most of what's available—up to ten channels can be used simultaneously. Additionally, up to ten transmitters can be paired



UniPak body pack transmitter with MT830cW omnidirectional lavalier mic.

with a receiver module, though it will only recognize one transmitter at a time. That prevents any interference that would render a UHF system unusable if two transmitters on the same frequency were turned on simultaneously.

The System 10 Pro provides three levels of diversity to assure stable transmission and reception: frequency, time, and space. Frequency diversity transmits on two dynamically allocated frequencies. Time diversity transmits on multiple time slots for increased immunity to multipath interference. Space diversity incorporates two antennae on each transmitter and receiver for signal integrity.

2.4GHz pros

Beyond that, there are distinct advantages for a system that functions in the ISM band: It is not susceptible to interference from UHF systems. And operation is very easy, no frequency coordination required. Additionally, 2.4GHz systems can work anywhere, worldwide, with no license required.

Tale of two transmitters

The ATW-T1002 handheld transmitter features a unidirectional dynamic microphone capsule. Audio-Technica has a substantial lineup of microphones. While I couldn't determine what model this capsule is related to, A-T has a deep and established lineage and has the designing-and-building-microphones thing down pat. There is a small window on the upper portion of the transmitter that displays the system ID and power/battery/mute status. The window is unobtrusive and has a dark tint that blends in with the rest of the transmitter body. It also has a wing-like appearance that is repeated at the bottom of the transmitter with the System 10 logo and the Audio-Technica logo. At the end of the transmitter is another A-T logo (slightly recessed into the body of the transmitter), which is also the power switch for the mic. As with many handheld trans-



ATW-T1002 handheld dynamic microphone transmitter.

mitter models, the lower portion screws off to reveal the battery compartment for two AA batteries, a small screwdriver on one side, and a pairing switch and level control on the other. The screwdriver is used to adjust the transmitter level control.

The UniPak transmitter features the same complement of indicators and controls, albeit in a different configuration. The "wing" indicator window is repeated as well. At the top of the transmitter is a power/mute button, a short antenna, a power/mute/battery indicator, and the microphone input connector. Additional microphones, including head-worn mics and accessories, are available for the UniPak transmitter.

The RF output for both transmitters

is 10mW. Battery life is around seven hours for both the handheld and UniPak transmitters.

Make a beautiful pair

As I mentioned, the system will work right out of the box, with no setup, dialing in, or adjustments to be made. However, depending on the circumstances of a given application, the System 10 PRO allows for reconfiguring.

The process of pairing is as simple as pushing a button on the receiver chassis and then pushing a button on the transmitter and then selecting another system ID (three buttons). It's just like pairing a Bluetooth device.

The System 10 PRO provides for level control at the transmitter and at



Receiver with Ethernet cable plugged in for remote location.

the output of the transmitter, though A-T advises that the receiver volume level should ordinarily be set to "max." The level control at the transmitter is set by using the input source, typically voice, and adjusting with the included screwdriver until the audio indicator LED remains green, or just turns yellow on peaks.

I really appreciate the simplicity of the system. It makes setup a breeze. I was curious as to what would happen if the receiver units were switched. The chassis is receiver unit-agnostic, meaning that regardless of the bay that a given receiver module is plugged into, Channel One will always be Channel One and Channel Two will always be Channel Two (or whatever channel that you designate it to be). The electronics

that control the channel selection are specific to the chassis.

This has applications in many different scenarios such as youth-, or classrooms at a house of worship, where it won't interfere with other systems in the same building, or a UHF system. The same would apply in a meeting or conference application, particularly mobile corporate systems. There is no frequency coordination to be done if you are in a larger facility with multiple wireless systems deployed throughout. The system is appropriate for practically any mobile application.

While the manual recommends staying at least 30' away from a wireless router, I did my initial testing in my home office with a wireless router less than 5' away and there were no issues.

The System 10 Pro innovatively incorporates the technology at hand to address some of the perceived shortcomings of 2.4GHz, and increase the effectiveness and application of the product. While wireless systems that operate in the 2.4GHz region function best when there is line of sight between the transmitter and receiver, A-T simply took advantage of the smaller electronics package required for a 2.4GHz receiver, and made a way to build the primary part of the receiver so that it could be remotely located, if necessary, while the control electronics are stationed into the rack mountable chassis. My hat is off to the engineers and product developers at A-T. 📶

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