

Q. *I have been given an atomic clock which monitors the 60 kHz frequency standard station in Colorado. At those low frequencies, how can it send enough data to set my clock? Isn't there a time delay for the signal to be accurate over distances? (MB, Indiana)*

A. WWVB continuously broadcasts time and frequency signals at 60 kHz at a data rate of 1 bit per second using pulse width modulation. The code contains the year, day of year, hour, minute, second, Daylight Saving Time, leap years, and leap seconds.

VLF signals travel by ground wave; the delay of arrival at your location would only be 0.006 seconds. I doubt that your clock can display time that accurately!

Q. *I am thinking of replacing my outdoor loop antenna with an active whip like the LF Engineering H-800 or H-900, then reduce the electrical noise interference with an MFJ 1025 noise canceller. What should I use for the noise antenna? (Fred Edwards, email)*

A. The key here is the separation of the desired-signal antenna from the noise antenna so that you don't cancel both the signal and the noise. That's the reason to put the noise antenna near the noise; with that canceled, the only thing left is the desired signal from the receive antenna.

If I were doing the installation, I'd first mount the serious antenna as high and away from power lines and household noise as possible. It would be great if you could carry a portable shortwave radio with you as listen for the minimal noise spot to install the antenna.

For the noise antenna, simply run a random wire around the edge of your room (ceiling or floor) for some 10-20 feet; that should be enough to pick up enough ambient noise to cancel the lesser noise heard on the rooftop active whip.

The H-800 and H-900 are omnidirectional, while the loop is bidirectional. You may still wish to leave the loop in place in case you want to favor one direction over another. The H-800 is excellent; we sell a lot of them to very happy listeners. The primary advantage of the 900 is its slightly-greater dynamic range. If you are plagued with local overload, get the 900; if you aren't, get the 800.

Every situation is somewhat different. After mounting the antenna in that quiet spot, try placing that random noise antenna wire around in

different locations while playing with the noise canceller to find the best configuration for noise reduction.

Q. *How often should I replace my 100 foot RG-6/U outdoor coax cable? When I do, should I replace it with LMR-400? (Shon Clark, Concord, CA)*

A. RG-6/U is good, all-around coax for outdoor installations. The general rule of thumb for all coax, however, is to replace it every five years. On the other hand, my cable has been up for some 15 years and I don't detect any worsening loss.

LMR-400 is lower-loss cable, but only by 2-3 dB at 900 MHz, and it's considerably more expensive. You would only see very minor improvement on the weakest signals at that frequency, and even less at lower frequencies.

Q. *Years ago I remember a gadget that you plugged into an electrical outlet to use the household wiring as a substitute for an outdoor TV antenna. Did these things actually work? (MB, email)*

A. I actually have one of those in my quackery/fraud collection. They didn't work worth a hoot or they'd still be on the market and there wouldn't be rooftop antennas. Some of the deficiencies include:

1. Household wiring isn't resonant on any particular TV frequency for proper impedance matching;
2. Wiring is electrically long in terms of TV wavelengths, rejecting signals broadside to the wires;
3. Incoming signals were blocked by household aluminum siding and metalized Mylar insulation;
4. Since they were connected to appliances all over the house, they were rife with electrical interference;
5. Because wiring is routed near conductive wiring, ducting, and metalized insulation, it was lossy.

Q. *The Slinky® toy is periodically resurrected as a portable dipole for ham and SWL use. Can it be assumed that its performance is really the same as a conventional wire dipole of the same length? (email)*

A. Because the Slinky is, in fact, a coil, it has a Q (selectivity) which varies with frequency depending on how compressed or stretched it is. Thus, its bandwidth/impedance characteristics vary differently than a straight wire of the same length.

If we aren't concerned about the Q (as in the case where it's being used as a random-length receiving antenna), then yes, its performance (aperture to intercept signal voltage) would be roughly equal to a straight wire antenna of the same length.

Q. *When we saw fire trucks going by our house today, we got out a very old scanner that we picked up at an auction years ago, but didn't hear anything. Have emergency communications all gone digital? (Wendy Kedzierski, Berryville, VA)*

A. While digital has definitely taken hold of the public safety agencies, it's been in steps that were bad for scanner listeners for a while until the consumer electronics industry caught up. Here's a simplified chronology:

1. Years ago, everything was analog (like AM/FM radio);
2. For security purposes, agencies started using analog scramblers until the consumer market started making analog descramblers;
3. The FCC and Congress banned descramblers that were intended to decode privacy communications, but these devices were still easy to come by or even make yourself;
4. Scanner manufacturers introduced digital scramblers that couldn't be duplicated in the workshop, and manufacturers kept the algorithms (codes) confidential;
5. Along came trunking so that a given series of transmissions could keep changing channels and analog scanners couldn't follow them;
6. The scanner industry then made trunk-tracking scanners, so we got back to at least step 4;
7. Following communications failures after 9/11, a reliable digital standard was called for by the government for interagency communications; APCO P-25, an open (public) algorithm, not developed for security, was adopted and has been widely implemented;
8. Scanner manufacturers now make P-25 compatible scanners.

Of course, there's still the possibility that your fire department has simply changed frequencies! One easy way to check local frequencies for your area is to go to www.radioreference.com and look up Clarke County.

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. Mail your questions along with a self-addressed stamped envelope in care of MT, or e-mail to bobgrove@monitoringtimes.com. (Please include your name and address.)