TARGET DX

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I have a number of different items this time, some taken from letters received last Spring, and for which I apologize for the delay in getting them into print, and some others direct from the NRC listserv. I want to emphasize here at the start that the contents of the answers provided below are a composite of various replies also presented on the listserv. Some are my own responses, but many are not.

Q – In last April's column discussing portable batteries, you mentioned one which was available from a firm called Waeco, in Germany. Can you provide a mailing address ? I am also looking for more readily-available substitutes in the US, with the intent of operating a Drake R8A or an Icom R71 and a Kiwa loop from beaches or parks for someone who doesn't have a car.

A – The US address/phone is as follows: WAECO Adler/Barbour, Inc., 8 Heritage Park Road, Clinton, CT 06413; phone: 1 860 664 4911; fax: 1 860 664 4912

The first thought is that 8 D cells make 12 V. You can buy some high current NiMh ones - 9000 ma, yes 9 AMPS. One source for NiMH rechargeable AA batteries is Times2Tech, 105 Maple St., Maylene, AL 35114 USA; Phone: 800-239-2032,or 205-620-1408; e-mail: mack@ times2tech.com; Web: www.times 2tech.com. They hold a huge charge, and they don't drain out while unused the way most NiMH batteries do. RadioPlus also sells a battery pack for use with the Quantum Loop, Phaser, etc. It holds 8 D-cells and is fitted with two leads that fit the loops and phaser.

But the Drake R8B is a power hog, and requires a good-size battery for any long-term DXing of more than a few hours. A Sears DieHard deep cycle marine gel cell battery, which will provide enough power for a solid three nights of DXing with the Drake, is one choice. Another option is a DieHard wheelchair battery, which may not last as long with a Drake, but it's about half the size and weight of a full-size battery. Any Sears Auto Center should have a wide selection of batteries to choose from in the showroom. Or you could also use a small marine or motorcycle battery.

Keep in mind that the Drake receiver should be disconnected from the battery to conserve power when not in use, because it draws 0.5 amps when off. The R71 manual doesn't mention the current draw when running off of an external DC supply. Off of AC, it draws 30W max - mine draws 21W. Assuming 70% efficiency for the AC supply (assuming a linear supply), you could expect 15 to 20W or equivalently 1.25 to 1.7 Amps.

Unfortunately, most of these solutions are cumbersome physically in terms of size and weight, which may make them impractical for someone without a vehicle.

Q - I know that this might sound like a pretty basic question, but is there usually some point out from a transmitter where the ground wave signal peters out, but is before the "first bounce" of the skywave signal ?

A - For most stations, there is an area of reliable daytime groundwave coverage, and a smaller area of nighttime groundwave coverage, even though the station has a larger overall combined coverage area at night. Outside of the nighttime groundwave area is another area where there is a combination of both groundwave and skywave. Still further, the signal becomes all skywave. During the daytime, the skywave component of a station's signal is much smaller at most points within its coverage than at night. Since there is a significant area where there are both skywave and groundwave present at night, there really aren't any firm boundaries.

Where these areas fall depends on several factors such as power, antenna pattern, ground conductivity, antenna type, frequency, and time of year. Thus the answer is different for different stations. Even a station as close as less than 50 miles can be received via skywave at night.

Q - Why is the nighttime groundwave coverage area smaller? Do signals propagate along the ground better during the day than at night? Or is the nighttime groundwave area of reliability smaller because of increased skywave interference from other stations?

A - The latter. Even if given same power, omnidirectional day and night on a clear channel with nothing else there, the nighttime groundwave signal would be reduced by the station's own skywave signal.

Q - Meaning the station's skywave signal will cause interference to its own groundwave signal?

A - Essentially, that can happen. Let's say you had WABC coming in at midnight, and conditions weren't auroral, and there were no other signals on channel. If you hear some instability in the signal, that could be the result of multipath, where groundwave and skywave are both being heard. This was common in North Jersey with then-WQXR, even at about 40 miles back when I lived there. Other times the signal may be solid and steady, yet there could still be components of both which you might not notice.
In Gordon Nelson's original loop construction article he describes being able to use the altazimuth feature to null the daytime groundwave signal component of a local down to the point where the predominant audible signal was in fact skywave reflection (well within the primary groundwave contour).

Q - No air core loop that I've been able to buy or build (yet) can produce nulls as deep as those common on ferrite loop antennas.

A - Something's not right here. Many years ago, I performed a series of tests between my 'NRC' 4' altazimuth loop (built per the plans in the NRC antenna manual and still in existence) and the then-state-of-the-art Worcester Space Magnet SM-2 ferrite rod antenna and found just the opposite to be true. I'm not aware of any similarly sized ferrite-rod loops (8 – 9 " rod length or less) which will outperform a 4' air core loop in this regard.

Q - While I haven't tested a spiral loop side-by-side with a box loop, I think the spiral loop nulls are both deeper and sharper. The most useful nulls, however, are obtained when you use an air core loop to "spoil" the pattern of the ferrite core loop or when you use a phasing unit like the Quantum phaser. Often it's not the depth or sharpness of the null that's important; it's the "shape" and direction of the null(s).

A - I also conducted parallel tests between a 2' spiral (pancake) loop (unamplified) and my 2' box loop. Although the results weren't completely conclusive, I found that more often than not the box loop provided deeper and sharper nulls. However when a broader null is wanted, the spiral loop was the preference. With the spiral design, the nulls are blunted, and unsymmetrical. I believe this is because the loop cannot be center-tapped to properly balance it. The two sides of the winding are unequal. It is this balancing, and the use of a split-stator tuning cap that allows over 60 dB nulls on a 4-foot pre-amplified box loop. In Gordon Nelson's article on loop pattern distortion, he states that because of the ratio of width to face of the winding, a spiral loop should produce broader nulls and sharper peaks. He also states that in box loops, spacing of the turns is often critical – closer is better.

Q – I have two elevated longwires, one, about 250' long and end-fed; the other of equal length but off-center 'T-fed'. One runs N – S, the other E – W. Would termination of these provide any significant benefits ?

A – From a reception performance standpoint, I believe not. I've not aware of any strong evidence that termination of above-ground antennas of this length or shorter gain much in terms of directivity or signal strength. Termination can be critical in longer wires, and even shorter ones used in counterpoise to longer wires, but otherwise it may not be worth the effort, although if someone else has experience to the contrary I'll be happy to include it in a future column.

Q – Does grounding/termination of above-ground wires increase the likelihood of attracting lightning ?

A – The answer depends on the height, surrounding trees or structure, and how the wires are suspended. Lightning will seek the easiest path to ground, which usually translates into seeking the closest, highest clear path. Thus, a wire hung between and within trees should be a lower risk comparatively as opposed to an antenna strung from a metal mast atop a building. Similarly, a wire high up in the highest trees in the area is more likely to be struck than the lower wire amidst a number of trees.

Please remember to keep sending me your questions or your suggestions for future topic-oriented columns to me either via the NRCDXAS listserv, by off-line email or by regular mail! I'd like to acknowledge the many members who provided material for the answers in this column: Powell Way, Rick Kenneally, Chuck Hutton, Bruce Conti, Rick Kunath, Harry Helms & Gerry Thomas.