TARGET DX

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Sun, 05 Jan 2003

The items contained in this column come from recent discussions on the NRC listserv. I want to again emphasize 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 – Some of my most distant catches have been ones that came in almost or equally as well barefoot as with a loop. I've got an RS loop as well as a homemade 18" loop. While you can certainly tell the difference in gain with the loop antennae, I quite honestly don't see much improvement in Signal-to-Noise ratio.

A – This is not an unusual observation. There are some situations where that is the case for every DX location. The big improvement in Signal-to-Noise ratio comes with a balanced loop designed to do that. The 4' and 2' air core loops which are described in some of the NRC publications do that better than many others. But with similar loops working in the same place, there shouldn't be a lot of difference. Locally generated electrical noise, such as dimmers, photoelectric switches, thermostats, etc. can be brutal even with a good loop.

Q - When you use the alt-azimuth feature, aren't you then reducing or eliminating the directionality of the antenna? Seems to me that you would quickly lose whatever nulling capability you have when you tilt the antenna off of 90 degrees, yet people talk about alt-azimuth as being useful for nulling locals. What am I missing here?

A - The idea is that you first achieve your best null without employing the tilt, and then, trying to maintain that position, you introduce the tilt. That way, you hopefully introduce further null rather than losing it. There are two reasons for the up and down tilting feature: (1) the electric field of a groundwave is not exactly perpendicular with respect to earth. With imperfectly conducting ground, the front of the groundwave is tilted a few degrees; (2) when you are receiving skywaves, again they are not perpendicular with respect to earth. Since they are bouncing off the ionosphere at elevation angles of 0 to 90 degrees, it helps to be able to tilt the loop accordingly.

Q – I keep reading about phasing signals. Can you describe in a relatively non-technical manner the actual mechanics of this?

A - Simply stated, phasing involves receiving signals from two different antennas and canceling one out with the other. If you think of a radio signal as a wave, with peaks and valleys, then if you join that signal with a "mirror image" of itself (180 degrees out of

phase), the result is complete cancellation - in other words no signal. So to use phasing for DXing, you take two antennas - one antenna that is receiving your desired DX station and your local, and one antenna that is receiving just your local. You adjust the signals using a phasing unit so that your local station is coming in with equal strength on both antennas. Then you adjust your phasing unit to exactly cancel one signal against the other. You can essentially eliminate the signal from even very powerful locals. All that remains is the DX station.

If you have a local that is just a couple miles away, you can DX that channel by using the phasing unit to cancel the local signal. Also, while sometimes trickier to achieve, nulls from phasing are more "stable" than nulls from loops, particularly for skywave signals. So you can conceivably phase null the local on a Monday and DX the channel all week.

Amplifying further about phasing units, I'll quote Bruce Conti's response directly:

There are two basic home-brew phasing unit designs, broadband and tuned. I prefer the tuned designs. I'm using an MWDX-5 LC-tank tuned unit. I've done side-by-side comparisons with the DCP-2 delay line broadband unit, and the MWDX-5 wins every time. Each of the two antenna inputs of the MWDX-5 is tuned with a high-Q LC-tank, essentially peaking each antenna for maximum efficiency while reducing if not eliminating interference from adjacent frequencies and strong local overload. The end result - more signal, deeper nulls, lower noise. One side effect of phasing is that sometimes after nulling out interference, the remaining signal is extremely weak. On many occasions when I still had a readable transatlantic signal with the MWDX-5, there was nothing on the DCP-2 using the same antennas. Both types of phasing require some patience and practice, but nulling out interference is easier on a broadband unit than with a tuned unit. Furthermore, once you have a null or the reception beamed in the desired direction on a broadband unit, it holds over a wide range, while a tuned unit requires retuning on every channel. This broadband feature is handy for quick identification of parallels such as in scooping up several of the RNE Spain parallel frequencies at once. The other advantage to the DCP-2 is its compact antenna layout. This is one of the types of phasing units that can be used with a remote-controlled loop and whip mounted in the space of a car rooftop. The MWDX-5 is designed for longwires, super-sized broadband loops, Ewes, slopers, random wires and Beverages. So your application may determine which type of phasing unit is best. If the number of control knobs and switches doesn't scare you, then I would recommend one of the Mark Connelly "super phaser" designs that provides for both tuned and broadband operation. If you're working with wire antennas and want something a little more economical and easier to build, then go with the MWDX-5 design.

The individual tuned antenna inputs are simple LC-tank passive circuits, consisting of a tuning capacitor and a switch to select the appropriate inductor, along with a switch to select series or parallel tuning. There is a broadband amplifier on the MWDX-5 output, but I rarely if ever need it. The RF amp in the Drake R8B is usually plenty when needed. I believe the plans are available at Mark Connelly's WA1ION website or through NRC Publications.

Q – Why is it that when there's a period of very wet weather, the noise and interference levels seem to rise?

A – There are several reasons which can contribute. First, when the ground is saturated, ground conductivity is increased; so many electrical noises and external mixing products carry farther. Also, the same changes in ground conductivity can bring about changes in the coverage of local and semi-local stations. Still another factor is that dampness can create conditions conducive to transmission of mixing products and other spurious signals which might not be there otherwise.

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Since the publication of the season-opening column featuring DX websites, I've received a number of additions, which appear below:

FCC US Ground Conductivity Map http://www.fcc.gov/mb/audio/m3/

Component Color codes http://www.antiqueradio.org/art/recap13.jpg

Provides interpretation of color coding used to denote values on capacitors and resistors found in older radios.

"Bad Weather Blowtorches" List (stations known to run day power/pattern for storm emergencies) http://www.angelfire.com/wi/dxmidamerica/index.html

High school teams search www.ihigh.com

World Weather www.worldweather.org

Listing of Phone Area Codes & Exchange Prefix Lookup www.thedirectory.org/pref/
(this site permits only limited exchange lookups per 48-hour period)

BBN (Bible Broadcast Network) station listings
http://www.bbnradio.org/bbn/stations_and_ways_to_hear/us_map_of_stations.htm

"The Light" Network List http://www.sgnthelight.com/localstationlinks.asp

Spanish Alphabet / Pronunciations
http://www.orbilat.com/Modern_Romance/Ibero-Romance/Spanish/Grammar/Spanish-Alphabet.html

also http://mts.admin.wsfcs.k12.nc.us/Sgarden/alfabeto.html

Intercollegiate Broadcasting Svce (College Stations)	www.frontiernet.net/~ibs/stations1.html
Radio Station Databases	www.radioinfo.com
National Park Service Stations List	www.geocities.com/CvapeCanaveral/9952/nps.htm

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Please remember to keep sending me your questions or your suggestions for future topic-oriented columns as well as additional DX websites 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: Rick Kenneally, Chuck Hutton, & Bruce Conti.