



Target DX

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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 – When I am using a 4' air core amplified loop, often the audio will be distorted. Is this overload from too much Q ?

A – It is possible that the audio may appear to be distorted from a number of causes. One is that the loop, when amplified, could overdrive the input stage. Another could indeed be too much Q, which can produce a peak so sharp that the resulting signal may lose part of its sidebands. The combinations of these could easily be worse than the either one alone. Also, you shouldn't rule out the possibility that if you're nulling at the time, you could be experiencing interference between groundwave and skywave components of the signal.

Q - I'd like to experiment with various way of spoiling the "Q" of these antennas in order to use them with phasers. Doesn't the Quantum loop use a resistor or something for this purpose?

A - My 4' loop has a Q-spoiling pot included in the circuitry, however I've never noticed to have any useable effect. I've even substituted two pots of same manufacture with the same results. My 2' loop as one might expect, has less Q. I find that in some situations that works better than the 4' loop, but I've never been able to determine any consistency among those cases where this has occurred. I do, however, notice that I sometimes have more listenable audio on the smaller loop on those occasions when there's either sufficient signal or only moderate interference so as to not require the larger one, which could be a result of high Q.

The QX Loop uses a three-position switch (On-Off-On) with a 2.4k resistor on one terminal and a 5.6k resistor on the other terminal on the switch. The center terminal of the switch is connected to one side of the loop's coil, the resistors' leads are both connected to the other side of the coil. With the switch in the Off position, tuning is the normal high Q. Switching the 5.6k resistor in lowers Q a bit; the 2.4k lowers Q further. The QX Pro uses a 100k pot (in line with a 1.1k resistor). Wiring is similar to the QX loop. The pot has a built-in switch which removes the pot from the circuit and results in the normal high Q tuning. Setting the pot at intermediate settings allows fine control of Q.

Q – Is #14 AWG stranded copper wire likely to provide optimum performance on a 4' air core loop ?

A - # 14 is smaller than used on most 4' loops I'm familiar with. For instance, mine uses #10. That could make a difference, but I'd doubt it would account for all of it. With loops, the size of the wire makes more difference than with longwires. The original plans for the 4' altazimuth NRC loop call for #12. This size was the result of both experiment and calculation as to the necessary diameter to create the desired effects. Alteration of the number of turns, spacing, wire size or tank coil diameter can alter the optimum values for any or all of the others. I used # 14 on my 2-foot loop as a part of the scaling down process, and have been very happy with its performance over the years.

Q – On my remote-tuned loop, the signal is routed back to the shack using RG-58 quad shielded cable, which is buried in a 16" inch deep trench, approximately a 140 foot run. What effect might this have ?

A - RG-58 is 50-ohm impedance, I believe, so that shouldn't be a problem. But I shudder to think about potential losses in balance and stability over that length. I really think that's the main problem.

Q - Using my remote tuned 4 foot air core loop outside, I can bring signals down about 10-15db, but not enough to copy other stations. Gerry Thomas pointed out to me in an off-list e-mail that perhaps I was picking up signal along the length of the coax, which would degrade the nulls. I plan to install 1:1 isolation transformers at both ends of the coax run to see if that helps.

A - I agree with Gerry. This has to be a result of the effects of the feedline and controls needed for your remote setup. A 4' air core loop should provide much more attenuation than 10-15 db even on a strong local. In the same article by Gordon Nelson on loop pattern distortion, he states that the number one cause of this is vertical pickup of signal or noise by the feedline, which reduces the symmetry of the nulls as well as the depth. Insufficient null depth is almost always due to "stray" signal making its way to the receiver. According to various articles, a properly constructed balanced 4' box loop with altazimuth feature should be capable of nulls in excess of 60db.

I don't believe that isolation transformers will correct the problem. I think it's the combination of loss over that length as well as unwanted pickup, and at some point, adding more transformers does more to increase the loss than it does to reduce the unwanted pickup.

If a balanced 4' loop with 6-8 feet or less of feedline doesn't exhibit the same characteristics (and I'm betting it won't) I'd blame the feedline. Another factor known to influence null depth is the spacing between the windings of the loop's tank coil. As a rule of thumb, these should be close enough together that the distance is about the same as the wire's diameter.

Also, be aware that stations within a radius of about 300 miles are sometimes difficult to totally null out due to the fact that the signal reaching the antennas is often composed of both a groundwave and a skywave component.

Another article which is available as NRC Reprint A12 is “The Vertical Pickup Pattern of the MW Loop”, which addresses this issue.

Q - I am experiencing substantial computer monitor interference, which creates strong buzzes about every 28 kHz or so. Does anyone have experience with any of the flat-screen monitors, and do they by some chance radiate less ? Or, failing that, are there any quick-and-cheap solutions ?

A – You might want to try using the clip-on ferrite chokes sold at RS and other places on the cables. Using three of these on both the monitor cable and the power cable reduced the computer noise to almost nothing. Using one had almost no effect, you really seem to have to stack them for any benefit. The flat screen LCD monitors seem to not radiate at all! You can hold a portable within inches of it without being able to detect a trace of noise. Also, there are lots of companies that offer products to improve the shielding of these types of enclosures. Just search on the web for EMI/RFI shielding. If you're stuck with using a CRT for now, and don't have the ferrite chokes available, one workaround to keep in mind is that you can shift the frequency of the birdies when they interfere with reception by temporarily changing video modes.

Q – I have a Kiwa loop, which I want to use without the AC power supply, as I find that the supply does generate some noise, which is a problem when nulling, or with very weak signals. What can I expect in terms of battery life if I use batteries, and what kind might be best ?

A – The large Kiwa loop can be operated quite satisfactorily using two readily available 6-volt lantern batteries wired in series. These should last 2 or more years in normal service. There are also some physically smaller box-shaped batteries available in the 6-volt size, which can be wired the same way. With smaller batteries, of course, comes shorter life.

Q – What is the best method to use to obtain a solid ground ?

A – Probably the best method is to use ground rods sunk into the ground. The depth should be sufficient to get you down into damper soil than you'd find near the surface. I'd aim for a minimum of 3 to 4 feet in-ground. If the purpose is to ground your equipment, then bring in copper wire from there to the shack. If the purpose is antenna grounding, there are different ways to do this, depending on whether you're using it for termination or simply for lightning protection, so check the specific instructions for the type of antenna installation.

It's usually not a good idea to use the same ground that is used for telephone or electric service, because these can introduce unwanted noise, but if that's all you have, then that's

what you have to use. Good, inexpensive ground rods can be obtained at Home Depot and probably at other similar home centers. Installation is best done when the ground is very wet, to make sinking the rod easier.

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!

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