

the irca technical column

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This time we have a couple of antenna articles, as well as some miscellaneous bits of info. Apologies to Don and Glen for holding their articles so long, but there was a real backlog for the column.

The Practical Beverage Antenna

by Don Moman

Anytime you take upwards of a thousand feet of wire and attempt to erect a Beverage antenna you will find two ways to do it--a hard way, and an even harder way! Depending on the site you've chosen, "hard" can be anything from "not very" to "extremely".

First, let's start with a very short explanation on a long subject--the Beverage antenna. It's a length of wire, normally upwards of 1000 feet for the MW band, erected a short distance above the ground. The height is dependent on what you have in the way of supports available (trees, poles or whatever). I would suggest keeping it above the height of the tallest person you anticipate to be in the area. Common sense and the threat of a possible lawsuit make the reasons obvious!

The first step in planning a Beverage DX'pedition is to find a place to go. In many areas of the country this can be difficult to do. Two things have to be considered--proximity of the site to nearby medium wave transmitters and the topography of the site. The signal levels provided by the Beverage when pointed at nearby transmitters can overload even the best receiver! Topography--is there enough room to string out the wire in the area you desire? Remember the antenna must be pointed to the area of the world you are trying to DX. Is the "horizon" relatively clear? Aiming a Beverage at the base of a ten thousand foot hill is not particularly good planning! A secondary consideration of the site is the presence of trees for supports. A dense jungle is not desirable nor is a rocky mountain ridge. Both make wire erection a real chore. The well-equipped expeditioneer can easily bring his own "trees" with him at a minimum of expense and weight.

The supports I use consist of 1"x2"x8 foot lengths of cedar with an eye screw at one end. To hold these in the ground I use a foot long piece of pipe (TV mast or conduit--both are fairly cheap) with a 1/2 inch nail welded to them. This combination can be used in a wide variety of soils. (Desert DXers and other soft soil types need not concern themselves too much with this!). One end of the wood (not the end with the eye screw) is trimmed to fit into the pipe, then inserted into the pipe after the pipe has been inserted into the ground. I find about six supports per thousand feet is OK. The problem of erecting a straight Beverage is easy when you use this system--more so than trying to find appropriate trees in a straight line.

Setting up a Beverage presumes that you have obtained enough wire, or at least as much as you can. To the serious Beverage DXer, the term "enough wire" is almost never obtained. Any type of wire that you can obtain cheaply is fine, but if you have a choice you should look for a compromise between weight and strength. If you were planning a permanent Beverage, a heavy gauge of insulated wire would be preferred so that it will stand the rigors of winter storms etc. For a DX'pedition a thinner gauge is much easier to work with as it is easier to reel in and out. Speaking of reeling, yes, there are better ways to handle the wire than coiling it by hand...

After several bad tangles using the hand method I quickly decided there must be an easier way. A spool of wire with a broom handle through the center is fine for letting out the wire, but it leaves a lot to be desired when it comes time to reel in the wire. Fortunately there is a ready made reeling system available at your local hardware store. The common garden hose storage reels, the flow through type, do the job very well. They come with their own mounting bracket which can easily be attached to some solid surface--I found the bumper of a pickup truck to work fine. The reel runs smoothly on its mount and the handle makes winding up the wire quite easy. The normal reel will hold many thousands of feet of wire; with 18 gauge wire I would expect about 4000 feet of storage, and with the 24 gauge I use, likely about 20,000 feet. The heavier gauge the wire, the more friction is encountered. After the first 2000 feet the going can be rather rough! A thinner wire is much, much easier to pull and with proper care it shouldn't break.

Stringing the wire is by far the hardest part of the job. After mounting the reel securely you are ready to start. It should be mentioned that the other end of the wire should be tied tightly to the reel so that when you have all the wire unreeled you know when to stop! Sort of like the story about the hockey player that got a break-away on Lake Superior, they never heard from him since! Tie the end of the wire around you waist--it isn't hard to pull now, but a few thousand feet later it may be quite a load. Take a medium length pole with you and concentrate on walking a straight line. If you can find an object on the horizon that is in the right direction it will make this part easier. When the wire becomes tight indicating the end has been reached, pull it tight and anchor it. Bring a small stake along if you don't anticipate a tree being nearby. On the way back use the pole to lift the wire into the trees or onto your supports. It is easier to do it this way than as you're pulling out the wire. Using the latter method will increase friction and make it harder to get the wire tight.

Well, by now you have erected the basic Beverage antenna. Only a few more items to go and you'll be ready for DX'ing--if you aren't too exhausted by now! Unless your receiver is directly in line with the Beverage you should be using a shielded type of lead-in. You may reduce the directivity of the Beverage if your lead-in picks up very much signal. You may also want to terminate the far end to reduce signal pickup from the rear of the antenna. At the far end of the Beverage you need a 400 to 600 ohm resistor connected between a ground and the Beverage. The resistor should be non-inductive (carbon, not wire wound type) and either a selection of different values or a variable resistor is helpful in making the termination properly. Experiment with the value of resistor till the signal from a station located off the back is minimized. A second person and a pair of walkie talkies is nice otherwise you will need to be a marathon runner! Finding a nice ground is also a problem in many types of soils. For permanent type installations, such techniques as making your own ground by burying a large mass of copper like a car radiator is OK, but it's not too good for a DX'pedition. A solution would be to use a set of radials, a wavelength long which would act as a ground. (ed note: extending the wire another 1/4 wavelength after the termination resistor is supposed to work quite well)

The above techniques can be refined to a certain degree but they represent the easiest way that is available to most DXers. I managed to home-brew a gear driven arrangement and couple it to an old 12 volt DC motor. Doesn't help the wire going out but it sure helps for winding it in! Try cranking 4000 feet by hand and you'll know what I mean.

I hope this covers the gap between the theory of the Beverage antenna and its actual use and performance. Much has been written about both these topics but I haven't seen much on the actual question of practical Beverage stringing. Readers' comments and/or questions are always welcome. I can be reached at 6815 - 12 Ave., Edmonton, Alberta, Canada T6K 3J6.

More on Beverages (from Sheldon Remington)---Several items were recently published in QST magazine concerning Beverage antennas. In fact, the cover story in Jan. 82 is a reprint with updated comments, of H.H. Beverages' original 1922 article on the antenna. It is the most thorough analysis I've seen on the subject. Two earlier items, dealing mainly with the gain of Beverages, appeared on p. 51 in Sept. 81, and p. 55 in Dec. 81. Another source of info is the Beverage Antenna Handbook, by Victor A. Miesek, available from Ham Radio Bookstore, and possibly from Century Print Shop. It focuses mainly on 160-meter electrically steerable 2-wire Beverages.