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A SIMPLE GUIDE TO BEVERAGE DX'PEDITIONS
by Doug Nyholm

There has been alot written about Beverage antennas; however, much of it is either quite technical or DX results from the use of one. This article will deal with the basics on how to erect a Beverage, and its use without going into mathematical details. Before I ever experienced DX'ing with a Beverage, I had all kinds of misconceptions. First of all, a small army of Beverage erectors, a mathematician and loads of complicated gear are not necessary. You may want to include more options as you become experienced, but to start with, all you need is a 1,000 ft. spool of wire and a few miscellaneous items.

First, you must find a suitable location to erect your Beverage antenna. This, of course, is going to depend on what area you live in, but here are a few tips: A large area of relatively flat, un-forested ground should be located. Trees themselves, do not have a significant effect, but if there is an excess of them, they can effect the signal. (Such as a dense forest). Also, the ground does not have to be flat - small or even moderate rolling hills will only affect your ease in erecting the antenna. If you are going out in the country, try to block the nearest city or dense radio transmitting area with a line of hills or mountains. Definitely do not erect your Beverage under any telephone or high tension lines. Pick a location so you can properly aim your Beverage without running out of room. If possible, take note that the power the ground conductivity, the better the Beverage will operate. However, this will also make it harder to install proper grounds. If in doubt about the use of the site, always check with local authorities or the owner; most likely, they will be quite interested in what you're doing. Lastly, take note if there are wild animals or hiking trails which cross your antenna path - a deer can shorten a Beverage antenna very quickly.

The most important part of the Beverage is the 1,000 or so feet of wire that is to be the antenna. I wouldn't recommend that you use any wire smaller than 22 AWG. Also, about two uses of the stranded type unless you want to look for internal breaks after about two uses of the antenna. 1,000 feet of 22 AWG wire (solid) will cost approximately \$25 - \$40 with stranded wire being about \$5 more, but well worth the cost. You may be able to find better surplus wire for much reduced cost if you look around. Don't shy away from single or multiple conductor shielded coax either. (I wouldn't want 10 or 15 conductors though). Actually, I believe coax is highly preferable to single conductor PVC covered hook-up type of wire. It is also very easy to check continuity of your antenna if it is already erected and you suspect a break. Of course, it's necessary when using coax to short all the leads together at both ends so as not to lose any of the signal due to inductance in the wire. I use a coax type wire that is effectively approximately 10-12 AWG and I can tell a noticeable superior signal than a 22 AWG wire, that I once used. I assume that this is due to "skin effect" of the shield creating less RF resistance and thus less signal loss. So keep in mind that bigger is better - to a point, anyway - you may need a truck if you plan to use 1,500 of #2 AWG wire!

Next comes the erection of the antenna. You don't need to hire a surveyor to come out to the site and mark out a straight line. Although some will say that a properly terminated Beverage in a straight line aimed at the intended bearing is the only way to do it. I disagree; I'm not saying that it shouldn't be done this way, just don't worry if you look back and see that its not in a perfectly straight line. Experiment on your own. I had some excellent DU reception in December, 1983 on a Beverage that took almost a 90° turn. It was erected at night with no moon, so I couldn't see where I was going. Most of my Beverages have had variations of up to plus or minus 20°, and the only time I took great care to make it perfectly straight, the reception was sub-normal. I really think that this was just a coincidence, however.

Now that you've got the wire and direction you want to erect it, what do you do? Look for a field of abandoned telephone poles, trees, fence posts, high weeds, etc. I've had moderate results just laying a wire on top of high grass that's an average of 10-12 inches above the ground and leaving it un-terminated. The dew was also so heavy that the ground was quite wet. That may work, but for sure, it's best to elevate it at chest level or higher if possible. However, height is not critical. This is just one example of how forgoing a Beverage antenna really is. Also zig-zagging it to use scrub brush or 3 feet high works relatively well. These methods are best suited for short term overnight type Beverages, and you would probably do well to take more time for a more permanent antenna. Don't use metal or wooden fenceposts if they are used to hold up metal wire. I tried this once, and even though the Beverage wire was 6-8 inches away from the barbed wire on wooden fenceposts, there was a minimum signal coming from even the semi-locals. I once heard a story of an Australian DX'er in the outback of Australia on 10 miles of abandoned telegraph wire on telephone poles. (The Falklands were probably S-9 +20 at high noon). If you find a situation like this, let the club know; maybe that would be the site of the next convention. What I use to erect and hold up the wire are 4 ft. wooden stakes - the type that you can buy at most lumber yards. Cost is about \$10 for 50 of them, depending on where you go. I just use a staple gun to attach the wire to the top of the stakes. Place the stakes at intervals so the wire doesn't sag excessively. Even if it touches the ground in a couple of places, don't panic. It's okay, and you probably couldn't notice any difference. If you have a few stakes left over at the end, just use those to prop up the wire.

Now you're standing 1,000 feet from your car with the end of the wire in your hand, and like myself, are wondering what is the best thing I can do with it. There are only two things you can do - 1) you can leave it hanging there un-terminated, or 2) you can terminate it through a resistance to ground. Termination is supposed to make the Beverage directional which is an entirely different subject. There are many articles on what size of resistor to use for the termination and I generally just use a 500 ohm resistor. Most people will recommend that the type of resistor be a carbon type, but for a ECB receiving Beverage, I really don't think its very critical, especially since you're not worried down to the exact foot, how long the antenna is. It is almost impossible to precisely determine the perfect value of termination to use anyway. The value will vary day to day with ground conductivity, time of day, frequency, length, etc. You might want to try a 400 - 1,000 ohm variable resistor; get a pair of walkie talkies and draw straws for someone to hike out and tune the resistor while you DX. Any volunteers? The ground you use (at both ends) should be the best you can get, as a good ground can add an S-unit and on a Beverage improve directionality.

A few things to take note of when planning a Beverage DX'pedition are how many receivers are going to be used and how many Beverages are you going to erect? If you have 4 or 5 receivers on just one or two antennas, you're going to have a mess of grounds and connections that will look like a plate of spaghetti. Besides the potential signal loss, if someone wants to switch his receiver to the other Beverage and knocks his buddy's antenna connections off, just as that 1,000 watt New Zealander was going to ID, you may hear some negative comments. What I did to solve this, was to buy a small piece of Plexiglass and outfitted it so that I can hook three antennas and the main ground to it. Then, by adding a terminal strip, so each input can be attached to four different loads by spade clips and handling everyone a couple of color-coded wires. It really works well.

I have also made myself a checklist as follows, with the items that are normally used, needed or wanted on a Beverage DX'pedition. Unless the Beverage is in your backyard, if you forget something, you'll have to do without it. My basic checklist is:

- Radio () Headphones ()
 - DC Adapter () Compass ()
 - Cassette () Flashlight ()
 - Stakes () Maps ()
 - Wire () Tools ()
 - Ground Poles () Various Logs ()
 - Paper & Pens () Auto Jumper Cables ()
- (Just in case!)

Now, just to say something about directionality and length of your Beverage. First, directionality, as stated earlier, is dependent on the termination. The length of the Beverage also affects directionality by the longer the Beverage, the narrower the beam. Remember, the Beverage receives on the end(s) and not on the sides like a dipole. The longer the Beverage, the lower the signal to noise ratio becomes, and the higher the gain becomes. In aiming your Beverage, even though the beam on a one wavelength Beverage is relatively wide, you want to at least get it in the right direction. To do this, a chart of great circle bearings or a great circle map for your area should be used. Significant errors can be made using a standard mercator projection type map. Now second, is the length of your Beverage. You don't have to calculate frequency to meters and meters to feet or think that your Beverage is only going to be useful for a nominal frequency range on either side of its actual length. 900 to 1,200 feet is more or less the normal for most ECB DX'ing, however, you may want to experiment with multiple wavelength antennas if you have the room. Following is a simple chart of lengths vs. frequency for some typical Beverages. Also, the common formulas to figure this on your own.

$$\text{Wavelength (meters)} = \frac{300,000}{\text{Freq. (kHz)}}$$

$$\text{Feet} = \frac{\text{meters}}{1.2} \quad (39.37)$$

$$\text{Wavelength (feet)} = \frac{984}{\text{F (kHz)}}$$

$$\text{Wavelength (feet)} = \frac{492}{\text{F (MHz)}} \quad \text{or} \quad \text{Wavelength (feet)} = \frac{468}{\text{F (MHz)}}$$

The formula using 492 represents the perfect theoretical values. However, it would probably be more accurate to use the formula using the value of 468, as this is corrected for a 5% difference of the speed of light in a vacuum to the speed of light in a resistive wire.

Values in feet/using	492	700	900	1100	1300	1500
Frequencies (kHz)	540	702	546	447	378	328
1 wavelength	911	702	546	447	378	328
1 1/2 wavelength	1822	1405	1093	894	757	656
2 wavelengths	3644	2808	2186	1788	1512	1322

A Beverage antenna is probably one of the best long haul DX antennas ever used, and if you've used one, you know what I mean. If you have never before tried DX'ing on one of these gems, you sure owe it to yourself to try. I hope that this article and tips herein can be of some use to you. Good DX'ing.