May 2005

FEEDBACK

The **OFFICIAL** Newsletter

of the

Georgian Bay Amateur Radio Club Inc.

P.O. Box 113, Owen Sound, Ontario N4K 5P1

GBARC Meetings
are held on the 4th Tuesday of every month except July and August in our CLUBHOUSE, Unit 6 Rockford Plaza, Rockford On. 5km S of Owen Sound.7:30 p.m.

Breakfast Anyone?
Any Saturday 9:00 a.m., at the Rockford Restaurant.

Nets
80 metre net on Sunday at 9:30 a.m. on 3.783 Mhz. Two metre net on Thursday at 9 p.m. on VE3OSR 146.94-Mhz.

Submissions
are always welcome.

This Month

An Alternative Dipole

Ham Radio Trivia

NEXT MEETING will be on April 26 2005 at the Rockford Restaurant

President
Gene VE3IJD

Vice-President
Bob
VE3XOX

Secretary
Tom VA3TS

Treasurer
Bob
VE3LKD

Newsletter Team
Editor
Barry VA3WBG
Steven VE3SEG
Tom VE3CVL

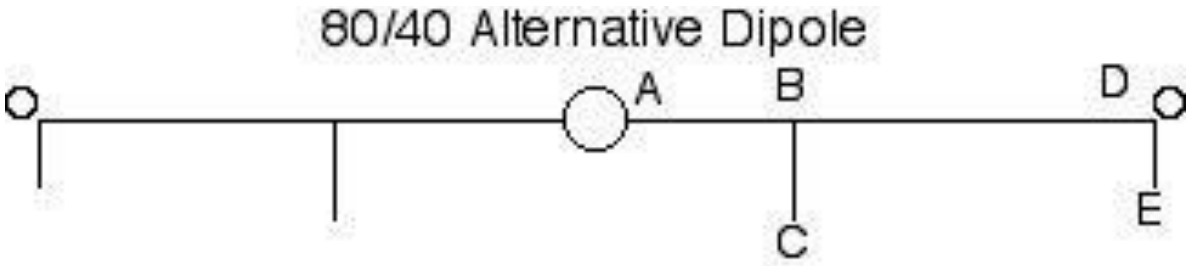
Program Director
Jim VE3CJM

An Alternative Dipole

Background:

One of my father's favorite sayings was, "necessity is the mother of invention." When I entered amateur radio I had two children, a full time job, and night school classes. I didn't have any mad money, and when I decided to add 20 meters to my 80/40 dipole I didn't have enough copperweld to add the two legs. Mayo McCallister, W0CW (SK), suggested the dangle approach, although he didn't call them dangles. That's my invention thank you. It did take me a few trials and tribulations to get it to work correctly, but it did work and quite well.

Foreground:



ABC is the 40 meter leg, and ABDE is the 80 meter leg. BC is the 40 meter dangle, and DE is the 80 meter dangle.

I have been reluctant to publish this article for reasons that will become very evident once you read it. So right up front I'll add a disclaimer or two. First, to all of those antenna-modeling engineers; no I have not modeled this. Secondly, this antenna is NOT for everyone. It has a few drawbacks, not the least of which is, it has dangles (which I'll explain in a minute). Depending on the band, these maybe as long as 6 feet and you don't want them someplace where others may inadvertently touch them. Further, this antenna works well as a four-legged dual bander, and is easy to tune with just an SWR bridge. However, if you intend to make it work on more than two bands, the tuning procedure becomes too complex for just an SWR bridge, and an antenna analyzer becomes a necessity.

For years I have erected my dipoles with dangles on the ends as shown in the drawing and the photo below. The reasons are simple enough. If you tune the dipole for the bottom of the band, you can easily retune it for the center or the top of the band by just folding or unfolding the dangles. After all, it is much easier to fold up a dangle than it is to re-cut or add to the length, and the best part is, you don't have to solder them when you need to retune. Another advantage, albeit slight, is it does add some end effect, thus the antenna is marginally shorter than it would be other wise. And it offers one other advantage seldom-mentioned in antenna handbooks.

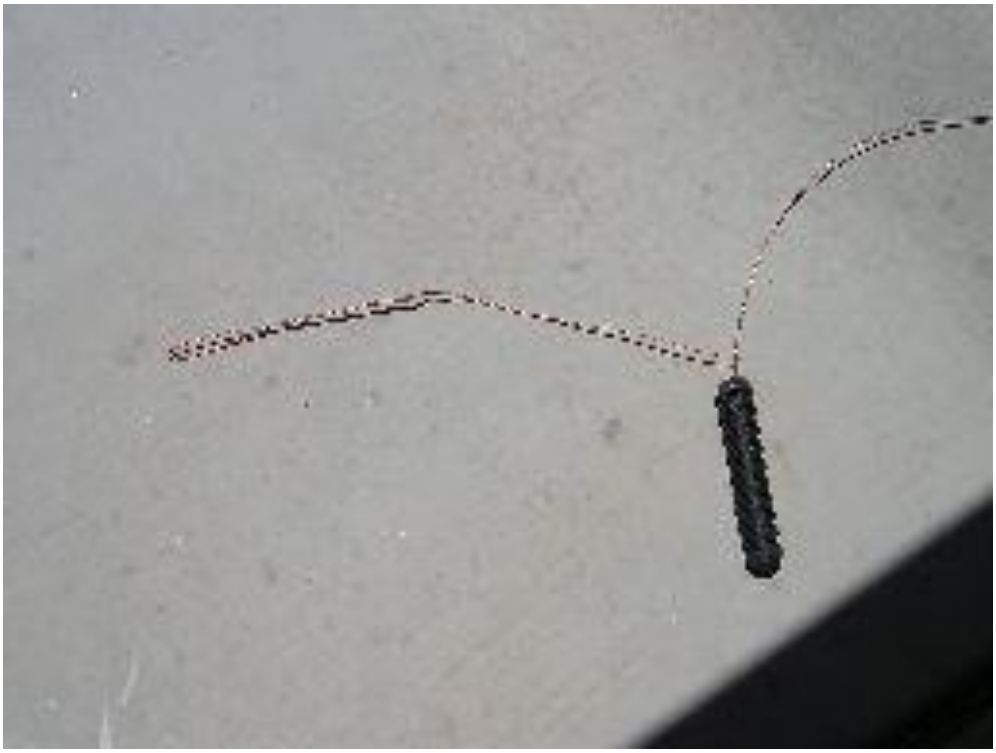
It is all but impossible to have a dipole strung high enough to clear all of the surrounding structures. There is always a tree or gutter in the way, or perhaps a shed or overhead wires. These always effect the antenna's balance. In most cases, the lowest SWR will occur when one leg is a slightly different length than the other leg. Having dangles makes this task considerably easier. When I last had the antenna erected, one leg of the 80

meter dipole was 8 inches shorter than the other leg, which reduced the on resonance SWR from 1.7:1 down to 1.2 :1.

While I'm on the subject of tuning, let me say this. This article is not a tutorial on how to erect or tune a dipole. Further, it is not a building primer, albeit I explain how I do it. You need to purchase an ARRL Handbook and/or antenna book for the finer details. In other words, you have to learn to do a few things for yourself. Quite obviously, making the legs longer lowers the resonant frequency, and shortening them raises it. Contrary to popular opinion, a dipole antenna doesn't require a 1:1 balun at the center. It will perform better if it has one, however.

The Dangles:

The drawing shows an 80/40 meter version of the antenna, but other dangles may be added to resonate the antenna on other bands. There needs to be a caveat here. If you intend to make the antenna cover other bands as well, you need to have those dangles in place before you start your tuning procedure. For the record, there is nothing special about the over all length of the dipole. You still use the formula of 234/fMHz to get the length of each leg. -- In this case 80 meters (3.5 MHz), or about 67 feet over all. The only difference is you subtract 3 feet from the results and this is where your end insulator will be placed. The remaining 3 feet is the 80 meter dangle just like the photo shows. You should use 3.5 MHz and 7.0 MHz as starting frequencies.



The dangles for the other band(s), 40 meters in this case, are indeed special. They have to be a minimum of 6 feet, and 8 feet works better if you have the clearance for them. -- Any shorter than 6 feet and you will not be able to tune the antenna on 40 meters. Please note the over all length of the 40 meter leg includes the dangle (refer to drawing above). On 20 meters and above, a 4 foot dangle seems to work well. All of the dangles need to be kept perpendicular to the main leg.

The 40 meter tuning dangles need to have a strong alligator clip on one end. This is for finding the 7.0 MHz resonance point. As odd as it might sound, you'll be sliding the dangle to and fro and the alligator clip makes this easy. I find that marking the antenna with a piece of tape helps in placing the two legs at the same starting

point, i.e.: over all length. Once you've finished tuning mark the spot, cut a new dangle, and solder it into place. For tuning higher than the base frequency, 7.0 MHz, just fold back the dangle.

Tuning:

No matter which method you use (SWR bridge or analyzer), tuning this antenna is not a ten-minute task. It almost goes without saying that you need to make provisions for raising and lowering the antenna. I used a pulley system. The first one I put up in Kansas City, back in 1970 took me several weekends to get right, as all I had was an SWR bridge. The one I put up in Denver, took me about 25 minutes to setup with the help of an amateur friend who worked the analyzer. That antenna was up for 4 years without any problems.

As I stated above, it maybe necessary to make one leg shorter or longer than the other leg, due in part to stray capacitance. This brings up another subject. Wind effects any antenna and this one is no exception. Because of the center dangles it's effected more than a regular dipole. When I've had this problem, I stabilized the center dangles with monofilament fishing line. The end dangles (80 meter ones in this case) don't seem to effect tuning if they're whipped around by the wind.

Any Advantages?

I suspect a multi-legged; multi-band dipole might work better, but from the reports I have had from my dangled dipole I doubt it. It is harder to erect, harder to tune, and indeed may be effected more by the wind. However, if you like playing with antennas, or you want to minimize the amount of hanging copper, the Alternate Dipole may indeed be an alternative.

One final thought. Even if you're making a monoband dipole, or a leg of a multi-band dipole, the dangles make tuning and retuning much easier.

HAM RADIO TRIVIA

---

1. What year was the YLRL organized?

1929

1939

1949

1959

2. What is the opposite of "conductance"?

Luminance

Resistance

Reactance

Brilliance

3. What is the mathematical equation for a 1/2 wave dipole?

291 times the frequency in Megahertz.

468 divided by the frequency in Megahertz.

937 plus the frequency in Megahertz.

Frequency in Megahertz divided by 2, then times 4

Answers for the April edition of Ham Radio trivia

1. Double triode

2. 31 Hz

3. Fielix the cat