

A Magnetic Loop – Bill Bates G6ATO

Good amateur radio aerials don't have to cost the earth, neither do they have to be elevated far above it!

I looked at building a “magnetic loop” aerial some time ago but after looking at various designs on YouTube I noticed that the emphasis was that the “main” loop was as good a conductor as possible i.e. copper. When I looked at 19mm copper tube for the project it was going to cost me an insane amount as the loops I had looked at all used around 3 metres to form a metre diameter loop, so I shelved the idea.

Having borrowed a receiving loop from fellow club member Bruce Southerland I still found myself determined to build one for myself and after a rig comparison evening where Bruce's Rx loop was used clinched things for me.

Back to YouTube and one American amateur I follow had built a mag loop using the hoops off of a discarded wheel chair with success, so I thought how about a bicycle wheel rim?

I put a request out on our works “buy & sell” intranet page and was quickly rewarded with one such mountain bike wheel! Stripped down to a bare rim and split with a hacksaw on the joint line all that remained was to cobble up an insulated mounting for an air-spaced adjustable capacitor and to this end an old polypropylene cutting board about 10mm (3/8") thick was used. The cutting board can be cut with ordinary woodworking tools and planes really nicely! Self-tapping screws were used & grip perfectly well in the cutting board.

The “active” part of the loop was constructed from soft copper automotive brake pipe covered in heat-shrink tube and terminated between start and finish onto a standard BNC connector. The active element needs to be roughly 1/5th of the diameter of the outside loop (20%).

The loop appears to receive perfectly well but I haven't tested it as a transmitting aerial yet, as my area of interest is low power radio (QRP) and I don't intend feeding more than around 5W into it I think the air-spaced capacitor that I have used might be fine, I'll let you know when I try it out!

The cost of the project? It was completely made from stuff that was lying around the shack or scrounged!

Looking forward to putting it through its paces, Bill Bates G6ATO