This inexpensive 1920s design for a 14MHz dipole offers some interesting parameters and is well worth consideration. Next time you feel the urge to play with bits of wire on a sunny summer day, produce an really old time favourite antenna in your garden.

Not interested yet? Then consider the following list of plus-points:

- No need for an a.t.u. (although it can improve things a little).
- Low s.w.r. over the entire 14MHz Amateur Band.
- Good DX performance.
- Low cost assembly.
- Good power rating. (100-400W - will work well on only 10W )
- Great eye catcher! (Make the G5RV boys jealous!)
- Easy to obtain components.
- Simple to construct.
- Coaxial cable - baluns are optional.
- No rotators needed
- No costly masts.

As you can see from the list above, early radio pioneers knew a thing or two!

Over 80 years ago on 6 March 1922 the newly formed British Broadcasting Company (later to become the British Broadcasting Corporation) commenced their Scottish Wireless Broadcasting Service in Glasgow. The pioneering BBC radio engineers of the day decided to use an antenna or as they would call it a 'transmitting or Sender Aerial', which would give broadband operation.

Transmitter effectiveness tests had shown that a horizontally mounted 'cage dipole' would provide a good coverage service throughout central Scotland. The antenna was mounted between two high factory chimneys at a site in Port Dundas near the middle of industrial Glasgow. This was the type of antenna used to introduce Scotland to public radio broadcast transmissions. As of course, it appeared in many other areas of Britain around the early 1920s.

Cage dipoles are still very much in use for many commercial radio stations and are used extensively on v.h.f. broadband services for aviation and maritime needs. They have simply refused to lie down and die, even after over 100 years in service. Marconi used them extensively in his maritime and broadcasting radio stations.

Their great attraction at v.h.f. is that they are fairly small, easily erected, combined with tuned resonators can give service in multi-channel operation. The v.h.f. types are often constructed in rigid format using heavy gauge wires or rods.

The wire variety used in the 1920s and 1930s for h.f. bands of Amateur Radio has lost popularity in recent years. This is due to being rather cumbersome and prone to windage problems, as well as difficulty in obtaining appropriate components.

This article describes how you can make one very cheaply and give yourself some DX surprises into the bargain. If you live in a windy location it might be best to build your cage dipole early in the Spring and take it down before the Winter gales. However, if you make it of a strongly constructed variety it will survive even a hurricane or two.

Amateur Radio is not just about collecting QSL cards or shouting "5&9 om - QRZ?" across the planet! It's also about having fun experimenting and who knows, maybe you will discover something new and exciting using this ancient, but worthwhile, design. And you get to say in your QSOs "I made it myself".

## Shopping List

For the cage itself, you'll need 40m (130ft) of good heavy Flexiweave copper wire with clear pvc cover (cut into eight lengths, each of five metre). Use the best quality Flexiweave you can get, though if you've nothing else you can use hard drawn copper wire or even mains cable. The latter choice may not survive too long, but should be fine for a trial period.

You'll also need: one plastic spacer (such as a 600Ω feeder type) or make your own,

## Looking At Construction

Now let's look at the construction. The most unusual components to obtain are the 230mm (9in for old timers) plastic rings. The rings must be approximately this diameter to work properly between 14 and 14.35MHz. I made mine from a children's plastic toy game called 'Dom Dom'. This game consists of two plastic bats like round tennis racquets with clear plastic instead of mesh in the middle.

In the game, the bats are used to smack the hollow plastic balls hence the onomatopoeic name due to the drum-like noise. It's just the kind of thing grandparents bring for younger kids on a quiet Sunday afternoon, so annoying already stressed parents.

Each game set has two bats so you'll need three sets to make your rings. These games can be found in most toy stores or street markets that sell cheap toys. There are similar game bats around so use your hunting skills. But try to get as near to the 230mm (9in) diameter as possible.

Once you have your plastic bats simply cut out the plastic skin or mesh in the middle and cut off the handles carefully with a hacksaw. When cutting off the handles do not cut too near the rim as the rings are often hollow.

You now have your six antenna rings ready for drilling. What you do with the six plastic balls, and the pieces of handle left over, I leave to your imagination!

Drill four 5mm holes in each ring as per **Fig. 1**. Now thread the four lengths of the heavy flexiweave copper wire through three sets of rings**.** With the other four lengths of wire and three other 'ring', repeat the threading to give you the other half of the cage dipole. Secure the wires in the rings with small insulated copper wire ties, see **Fig. 2**.

Ensure your rings are equally spaced. I found it helpful to fix one end of the set of wires to a hook on a fence post whilst assembling the antenna at this stage. Finally, connect, either by soldering or using single pieces of chocolate block type connector, a 75Ω

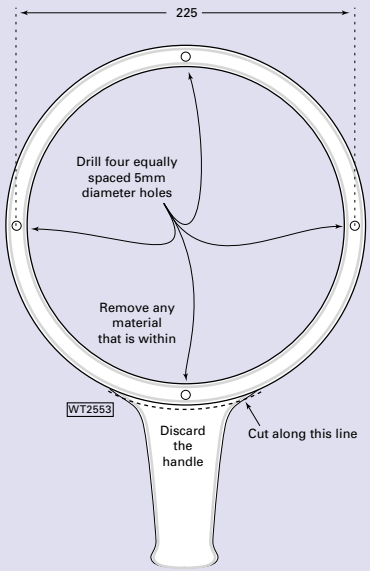


Fig. 1: Cutting and drilling details for the plastic racquets, you'll need six of them for this design.

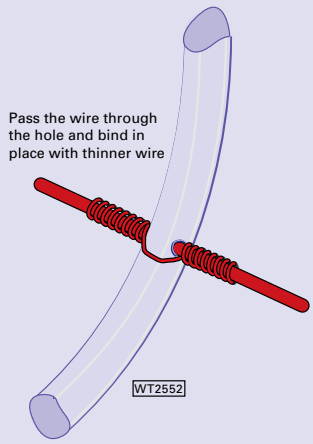


Fig 2: Details of the method of clamping used in the cage antenna.

Fig. 3: A closer look at the centre of the antenna at Ian's location.

two: 'Dog Bone' Insulators, two off: fishing swivels (optional), six off: 230mm (9in) hollow plastic rings (see below for details), suitable length of 75Ω twin feeder wire (flexible). The length of this wire will depend on the distance between the antenna and transmitter. (I've found that twin black/red low-voltage power {6/10A} cable is approximately 75Ω and works very well). You'll also need scraps of insulated stiff copper wire. (bits of mains cable will do nicely), as well as a roll of self amalgamating tape.

twin feed cable without a balun, **Fig. 3**. I've found that this type of feeder will give much better results and less TVI. Please note, that if you do use 75Ω coaxial cable feed, you should fit a 1:1 balun at the feed-point.

Once you have assembled the antenna wrap all joints and bind the ends of the cage wires with self-amalgamating tape to waterproof and add strength. Each of the 'outer' ends are then fixed to a dog bone insulator. Fishing line swivels at the end dog bone insulators are optional but they do help reduce wear and tear as the cages tend to revolve in the wind. The support ropes or lines may be added.

At the centre point of the antenna, the four wires are similarly joined to each feeder wire. You've created a four wire simple 'fat' or cage dipole, as shown in **Fig. 4**. Please remember, cage dipoles tend to be quite heavy so the mount points must be strong and secure. The effect of wind (or 'windage') can be anything from four to six times greater than a G5RV or W3DZZ type dipole.

When assembled you will be the proud owner of a 14MHz Cage Dipole and the envy of all those guys with boring old single bits of wire and the friend of all the wee birds in your garden.

## What Results?

So, what results, have I had with this antenna you may ask. Well, from my QTH in South West Scotland I've had regular contacts on voice with Brazil and the USA (and with Australia when using summer 'grey-line' techniques).

One of the delights of using the cage dipole is that there is really no need for an a.t.u. as it has a very flat response over the whole 350kHz (UK) allocation on the 14MHz Amateur Band. A low s.w.r. should be possible over the entire band if the lengths of your wires are cut accurately.

For good DX it's best to mount the antenna as high as you can. If your garden is small try using it as a 'sloper' from say the chimney to a post about two to three metres off the ground. As an inverted V antenna it will still perform well.

The 14MHz Cage Dipole that I put up worked extremely well, until a very strong gale broke it at the centre point. I'd not used very good Flexiweave wire to be honest so, it was remarkable that the antenna had survived for so long during the winter storms that we experience here on the coast.

Come on all you new M3s, this is your chance to really impress the neighbours with a great eye catcher! It should give you great results even with 10W.

I would appreciate reports by E-mail if you build this antenna and also details of how you found your rings? You can contact me by E-mail at **weebooks@globalnet.co.uk** with reports. Good DX!

PW

# CAGED

# A Beast of a Signal!

**Ian Macdonald MM5WIG suggests that a step back in time, with his low cost 1920s style 'Cage Dipole For 14MHz' will be a step forward for your signals.**

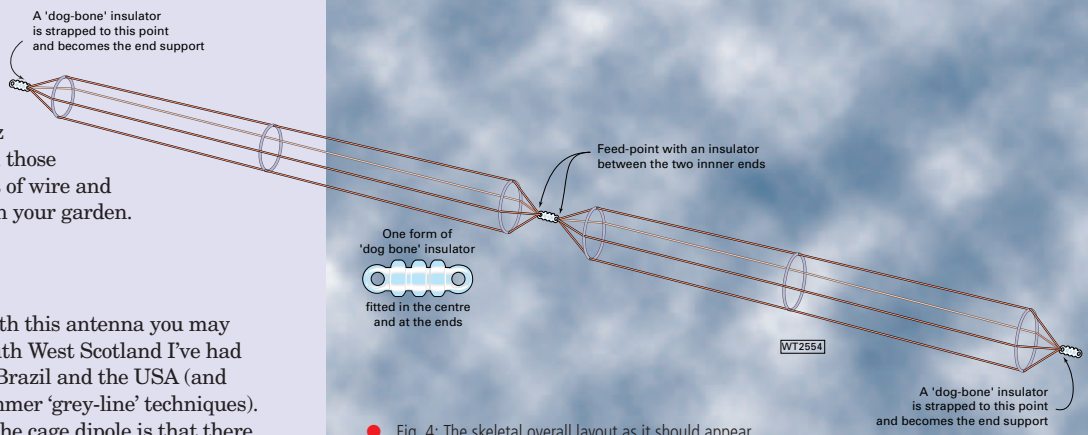


Fig. 4: The skeletal overall layout as it should appear when erected. Ian recommends, using 70/75Ω twin rather than coaxial cable to feed the antenna.