



Ray Howes G4OWY's Antenna Workshop

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Tin-tenna-2!

Antennas in tins? Not quite....but nearly! – It's another antenna from tins!

Inspired by a previous 'Tin-tenna', Ray Howes G4OWY shows you how to create another type, using recycled tins.

Once upon a time, there was a 2m antenna* cleverly designed by PW's Tex Swann G1TEX - and not only was it environmentally friendly (because it was fashioned from what would be a normally thrown away item) it was exceedingly small and cute and apparently works a treat. Never again will I ever look at a coffee tin lid in the same way again – or just carelessly toss it in the nearest bin.

(* Antenna Workshop April 2010 Practical Wireless p17, Editor.)

Green & Cheap

So, with the 'green credentials' of the environment in mind, not to mention what's probably the most important factor – how cheap it can really be to construct your own antennas – I present another 144MHz antenna that can be built from soup cans, along with an idea for another one that I'll try.

The beauty is that it doesn't matter which flavour of soup you prefer. Or, perhaps, if like me, soup isn't on the menu too often and tend instead to have a collection of beer cans piling up at the end of each weekend awaiting appropriate disposal, these can be used instead of soup cans. The choice is yours really!

As with most things antenna wise, some clever fellow somewhere in the midst of time has no doubt built exactly the same sort of antennas that I'm about to describe here. So, in that vein, I claim no originality. Maybe just like Tex or myself, a now long forgotten Amateur probably got creative and suddenly realised one day that a soup can or a

beer can could have a new lease of life, an alternative use - recycle it, make an antenna!

Ground-Plane Vertical

Before I move on, I did think about making a simple ground-plane vertical for 50MHz with all those empty and now unloved cans. I even got so far as laying them all out in a nice straight line down the garden path - just to find out how many I would eventually need. Needless to say, it was a lot. Trouble was, the thought of soldering a large pile of empty beer cans together didn't fill me with a great amount of enthusiasm, even if it was a tempting prospect cost wise.

For the first Tin-tenna then, you'll need four beer cans. I used four cans that previously contained the black-liquid - the stuff that long ago used to be brewed only in the Emerald Isle, but now, is brewed everywhere else too. Luckily, four of these cans stacked end to end measured at least 489mm. If the four cans you choose to use are longer than this, you'll obviously have to shorten them to the desired length.

Next, take a trip to the kitchen to retrieve the can-opener, as you'll need to cut off the top and bottom from three of the cans. But on the fourth can, which is shown as the top can in Fig. 1, the bottom is left intact. To this can after you've made the right sized hole in it, fit an SO-239 connector - one of those SO-239 connectors that has a square base with a hole in each corner.

At this stage (because you won't



Tex Swann's

antenna workshop

Taking time off from making or drinking coffee, Tex Swann G1TEX makes use of the tin.

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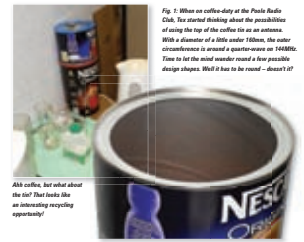


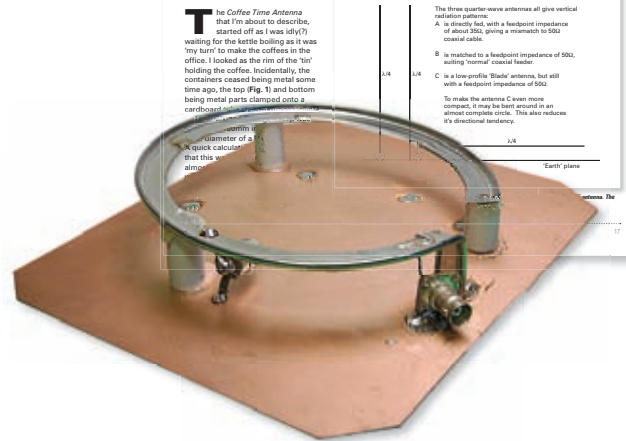
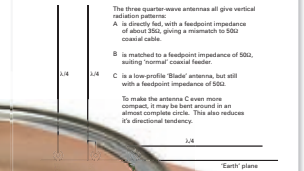
Fig. 1: When on coffee-duty at the Poole Radio Club, Tex started thinking about the possibilities of using the top of the coffee tin as an antenna. With a diameter of a little under 100mm, the outer circumference is around a quarterwave on 144MHz. Give it the most weather-proof & low-profile design shape. Will it be to be used - doesn't it?

Editorial introduction: Tex's coffee tin antenna is thoroughly practical - I've used one for several years and can recommend it to readers. However, Tex hasn't been entirely truthful about making coffee in the office. In fact, most of his experience in catering comes from running what he calls the 'Tea & Coffee Swindle' at the Poole Radio Club. In return for a modest weekly payment (the 'Swindle') we get good tea and coffee, the club makes a nice profit while Tex keeps the empty tins to make antennae! G3KFD.

All coffee, but what about the tin? That looks like an interesting recycling opportunity!

Don't Waste That Empty Tin – Make Yourself.....A Coffee Time Antenna!

The Coffee Time Antenna that I'm about to describe, started off as I was idly(?) waiting for the kettle boiling as it was 'my turn' to make the coffee in the office. I looked at the rim of the 'tin' holding the coffee. Incidentally, the containers I used being metal some time ago, the top (Fig. 1) and bottom being metal parts clamped onto a cardboard support.



be able to do it when all the cans have been successfully soldered together!), a length of coaxial cable with a PL239 plug on the end is screwed onto the SO-239 connector. You'll also need a PL239 plug on the other end of this length of coaxial cable, of course.

Secure Connections

After doing this, making sure the above connection is secure on the fourth can, the other three cans are now soldered together. I found a 25 Watt soldering iron did the business here. I didn't place solder around the entire circumference of all the cans - just a spot here and there.

A word about the actual soldering is probably in order here. When first trying to solder aluminium, it can be very difficult – if not almost impossible. Due to the very rapid oxidation of aluminium, the surface, refuses to be 'wetted' by solder. However, for whatever reason, the cans I used did after a bit of persuasion finally came together. I now think real-tin cans would be far better - soldering would be much easier and less stressful!

Once all four cans are happily joined up with one end of the coaxial cable appearing out the bottom, the next job is to solder a 482mm length of wire (19 inches in 'old-money') to the SO-239. This is the vertical radiator. For this, I used a length of fairly thick copper wire.

An back-to-back SO-239 connector - the one that joins two pieces of coaxial cable together is married with your feeder cable and the length of cable from the SO-239.

I didn't need to trim the vertical radiator on the initial tests, as the s.w.r. was already within my usual ball-park, 1.2:1 in the middle of the f.m. section of the 144MHz band. The s.w.r. rose to about 1.5:1 at 145.775MHz. The antenna was mounted at the top of a three metre tall wooden pole.

Signal Strength

And the funny thing is, the differences in signal strengths of most signals are marginal when switching between the Tin-tenna and a collinear located on my chimney at 12 metres high. So much for the commercial collinear, then?

In fact, the Bournemouth repeater (GB3SC) signal is now stronger than on the collinear! A happy outcome? Hope you enjoy building it as I did. And like me, you may not need that collinear up on the roof?

Finally, my next project using cans - might be the familiar and well-known 'J antenna'. I'll be using tin cans not beer cans this time - for reasons given earlier. I'll probably require a few more cans this time - so I'd better start drinking a bit more of the black-liquid or, drink more soup. Unfortunately, I think it'll have to be more chicken soup.

Soldering Aluminium

One last word on the problem of trying to solder to aluminium. The main reason of course, is that aluminium tends to oxidise immediately on contact with air. So, what I do is to give the appropriate area to be soldered a good going over with sandpaper.

Then, with a hot soldering iron, make a pool of solder over the part to be joined and whilst keeping this pool of solder liquid (there is no air present under the pool of solder so it won't oxidise), give the area several scratches in the pool of solder.

Next, all being well, it should be possible to solder those aluminium cans together. It is a fiddly operation and the deeper the scratches the better as it exposes more aluminium and the actual bond will be stronger. Another option I guess, would be a perfect vacuum - no oxygen equals no air to oxidise the metal underneath.

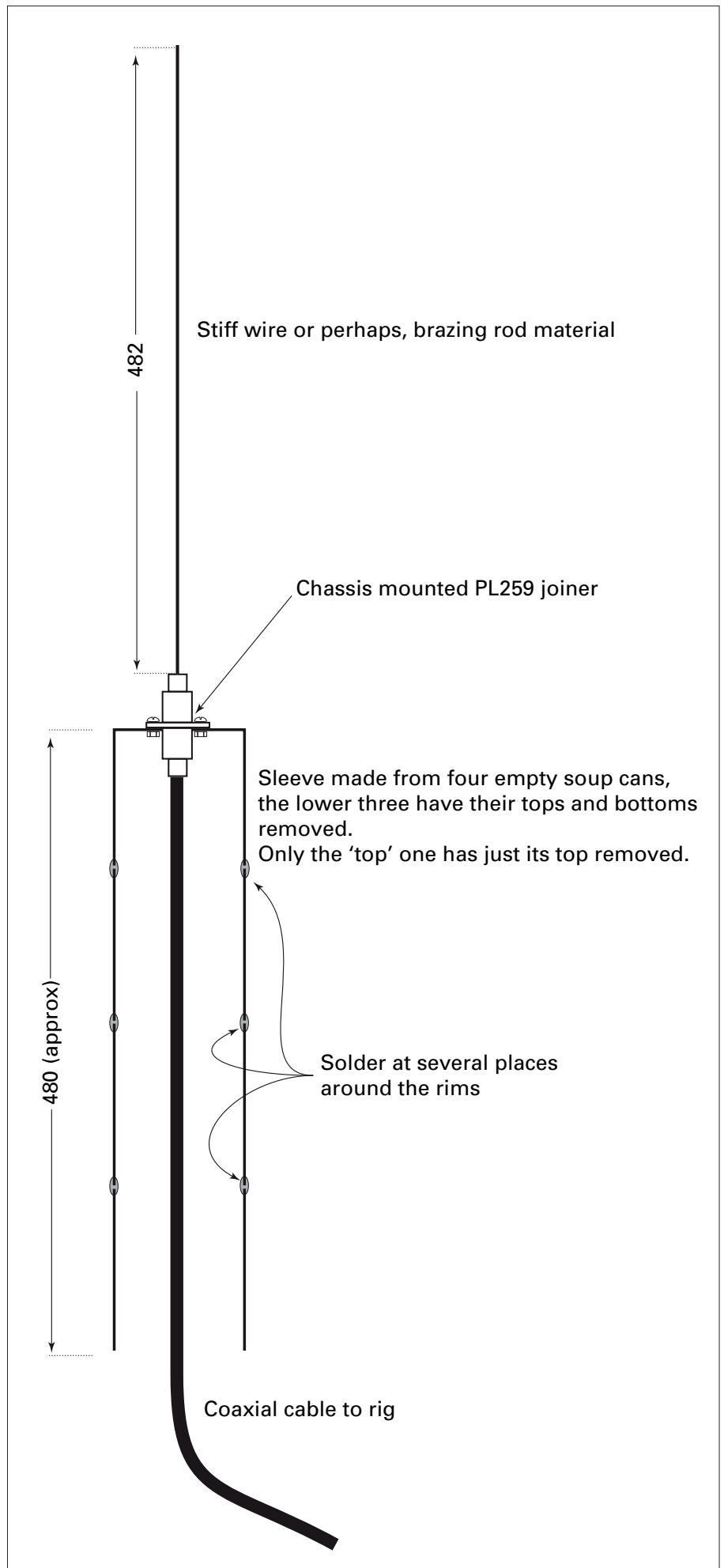


Fig. 1: A layout of the Tin-tenna, showing the use of the four tins to create the balun sleeve.