

Our technical editor 'Tex' Swann G1TEX takes a look at a new loop antenna that's eminently portable.

The G4TPH Magnetic-Loop Antenna

As I meandered around the outside area at the 2007 Castle-Donington Show, I spotted the display of **Tom Brockman G4TPH** who had two of his folding loop antennas hanging from parasol garden umbrellas. On display were two sizes of loop antenna, The ML20, which covers the 14-28MHz bands and the ML-40, which covers the 7-14MHz bands.

Tom kindly let us have one of each loop to try out so, let's begin! The two loop antennas look similar, though there are important differences. Each antenna kit consists of a number of flat aluminium bars, with holes 400mm apart near the ends. The ML-20 kit has eight bars, while the ML-40 has twelve. The ML-20 kit is shown in **Fig. 1**.

The difference of the number bars is easy to see but there are also two accompanying units that, if you had both loops, could be mixed up, without care. These units are the coupling units that feed the signal into the loop elements and the tuning units, **Fig. 2**. I've opened up one of the tuning units to see the capacitor

that's isolated by the box and knob.

When constructing tuned loop antennas, they're often fed via a secondary small loop or a tapping point on the main loop. Tom has used a ferrite transformer to couple to his loops, **Fig. 3**. It's the first time I've seen this method used – and it's so blindingly obvious – especially as I've seen the technique used for high current probes in measurements.

The transformer of **Fig. 3** is a formed from multiple windings for the primary, and the loop element itself forming the single secondary turn. Loop antenna have very high circulating currents, that equate to a low feed-point impedance. A neat idea!

Started Testing

I started testing the loops in a typical place – my cluttered shack. The smaller ML-20 loop antenna is around one metre in diameter when assembled, but the larger ML-40 is around 1.5m in diameter and rather more difficult to handle in restricted space.

The bars are held tightly together with a bolt and butterfly wing-nut. I found it best to put the shake-proof washer in between the aluminium bars for stability.

I hung the ML-20 loop from glass-fibre fishing rod supported between two wall lamps and used the **miniVNA** unit that I looked at in the December 2007 issue of *PW*. The composite s.w.r. curves are shown in **Fig. 4**. The ML-20 covered from about 12.5MHz up to over 30MHz, and could be adjusted to give an s.w.r. of around 1.5:1 within areas of each band.

How did they work?

You may ask "how did they work?" And the answer is that they worked well and would make a fine addition to any h.f. portable operation. They would be ideal for sticking into a suitcase when you go away.

The ML-40, covered 7-14MHz without problems making it suitable for the three bands of 7, 10 and 14MHz. But I also found that I could tune most of the 3.5MHz band with it too. Although the s.w.r. level

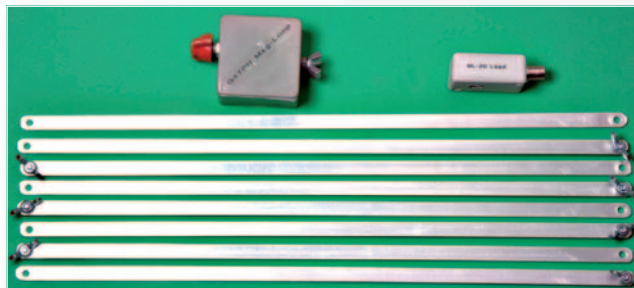


Fig. 1: The ML-20 14-28MHz kit laid out. The ML40 is similar with 12 bars, and slightly different units.

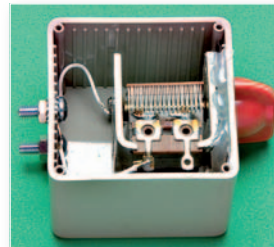


Fig. 3: The unusual method of coupling into the loop winding.

Fig. 2: The loop tuning capacitors are not suitable for high power, but suit the powers in use by Foundation Licencees or QRP enthusiasts.

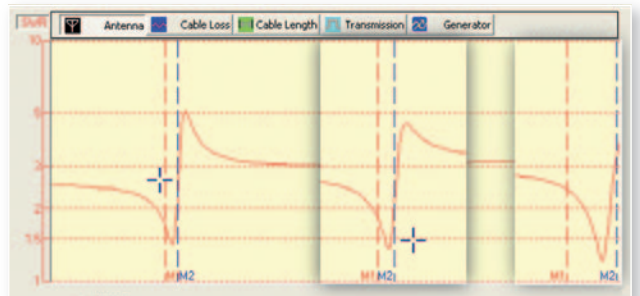


Fig. 4: The composite s.w.r. curves for the ML-20 unit, on the 14, 21 and 28MHz bands. The marks show the approximate limits of each band. The 18 and 24MHz bands are not shown for clarity.

on this band had risen over 2:1 minimum. These readings were confirmed by 'normal' s.w.r. meter and around 10-15W into the units. In use the loops were definitely quieter than my main outdoor antenna, but that is to be accepted. Highly commended!

Product Information

Product
G4TPH Mag-loop

Supplier
Tom Brockman G4TPH

Contact
1 Dalby crescent
Newbury, Berkshire
England
RG14 7JR

Pros
Both loops are easily carried and assembled and cover several bands with low s.w.r. values.

Cons
Not self-supporting, but are light enough to hang from curtain rails.

Web: www.g4tph.com

Prices:
ML-20
ML-40
Both

My thanks got to **Tom Brockman G4TPH** for the loan of both units, I've enjoyed using them. Tom's website has on-line ordering to make it easier.