IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

In many holiday spots, wire dipoles are difficult to install. **Fred Schultz, DL1OAW**, built this 7MHz **magnetic loop** which can be disassembled for easy transport. From *CQ-DL* 7/95

THE LOOP ANTENNA described here can be taken apart and reassembled **(Photo 1)** and is designed so that losses at the joints are minimised. It can be operated from ground level up, but care must be taken that people or animals cannot touch it. A low SWR makes an ATU superfluous. It must, however, be protected from rain.

CONSTRUCTION

FOUR STRAIGHT LENGTHS of square aluminium tubing, 50x50x2mm, are used to make up the loop, which measures 1.40m a side. The ends are cut as shown in **Photo 2** and joined with eight nuts and bolts at each of three corners. The mating surfaces at each corner have a surface area of 40cm^2 to provide a low contact resistance.

The use of straight tubing for the sides of the loop suggested a piston-type capacitor for tuning the loop. This was achieved using one section of the loop as the 'cylinder' of the capacitor and a 370mm length of 40x40x2mm square tubing as the 'piston'. The construction of the capacitor is shown in **Photo 3.**

Strips of plexiglass are used to centre the capacitor piston, which slides in or out with little friction or play. The air gap is 3mm, sufficient for a 100W transceiver.

A 0.5mm thick and 40mm wide flexible sheet-copper strap is used to connect the piston to the other side of the loop. **Photo 2** shows how the copper is firmly squeezed against the aluminium.

A nut, centred on the copper bracket at the end of the piston, permits the latter to be driven by rotation of a threaded rod which is connected, through an insulated coupling, to a small (22mm OD) reversible DC motor with integral gear reduction.

A 20mm thick PVC board [1] was used to assemble the components at the open end of the loop, as can be seen in **Photo 4**. The U-bolts holding the loop ends to that board were home made of M5-threaded galvanized-steel rod, flame-heated at the bending spots.

The coax coupling loop can slide up and down on a PVC tube to obtain minimum SWR in different operating environments.

To tune to 7MHz, approximately 300mm of piston is within the cylinder and a movement of 10mm will cover the band.

OTHER BANDS

THOUGH THIS WAS NOT tried, the loop should be usable on 10.1 and 3.5MHz.

To tune to 10.1MHz, withdrawing most of the piston from the cylinder should be sufficient.

For 3.5MHz, an additional fixed capacitor is required. [It must be a high-voltage high-current type. How much capacity is needed is easily established by clipping one or two 365pF sections of a receiver-type tuning capacitor across the piston capacitor and tuning them for resonance while *listening* (not transmitting) with the loop on 3.5MHz. Then measure the C value. The 3mm air gap of the variable capacitor, however, will probably limit the transmitting power to well below 100W - *G4LQI*]

NOTE

[1] Scraps of suitable glass-reinforced plastic board can sometimes be found where fibreglass boat hulls are built or repaired - *G4LQI*♦

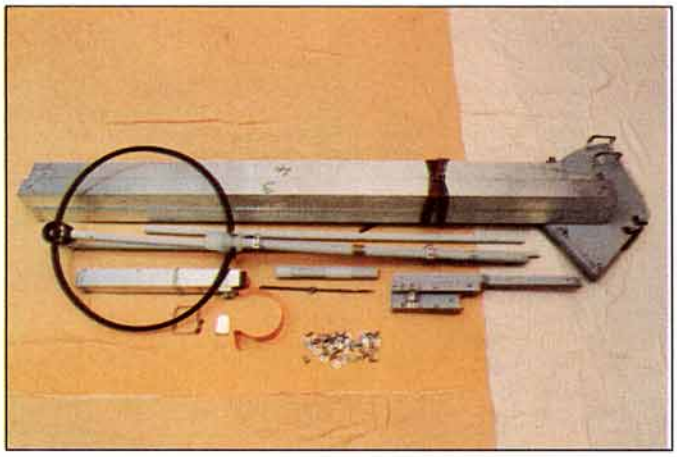

Photo 1: The antenna disassembled, ready for transportation.

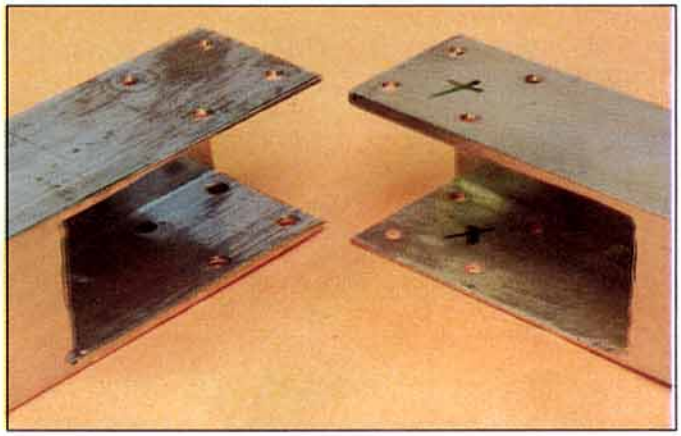

Photo 2: The ends of the loop sides are cut and drilled for assembly with maximum contact area.

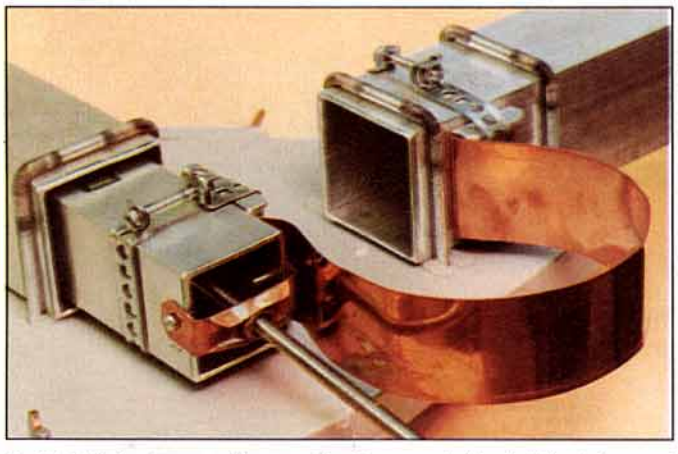

Photo 3: The tuning capacitor consists of a square 'piston' sliding into one of the square sides of the loop.

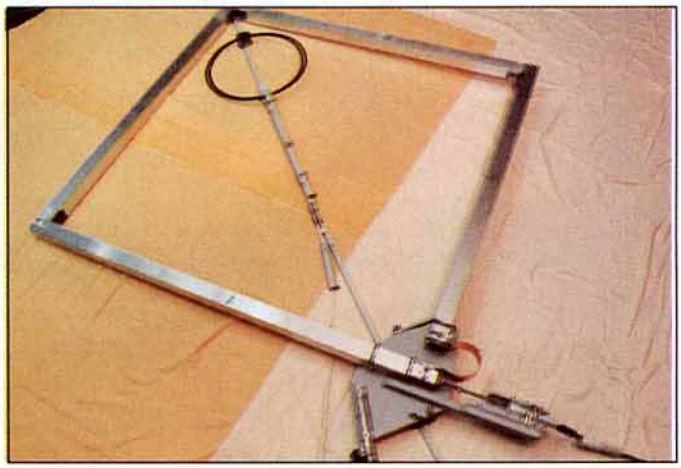

Photo 4: The loop assembled at the camp site.