Quadloops

The basic 'quad' loop consists of a vertically mounted square of wire or tubing, each side a quarter wavelength long — making a wavelength in total around the circumference (Fig. 1). In fact, if you consider it carefully, it is two half wave dipoles stacked one above the other with the ends of the upper half wave bent downwards, and the ends of the lower one bent upward until they touch. The net resultant gain is actually rather less than the optimum 3dB to be expected from stacking a pair of dipoles. This is due to the lack of stacking distance between the upper and lower dipole 'halves'. A realistic figure for the gain dBd of the aerial (i.e. with reference to a single dipole) is in the range 1-2dB. The quadloop, however, unlike the half-wave dipole, appears not to be so fussy about its height above ground and, as I shall explain later, the effective gain is thus somewhat greater.

Many readers will have noticed the praise lavished on full wave loop aerials in Sant Kharbanda's recent authorative series on aerials for LF DX working. As a follow up we include a design for an 'optimum', remotely switched loop antenna for 14, 21 and 28MHz by Malcolm Healey, G3TNO, with assistance from Anne Lambert, G6CXF.

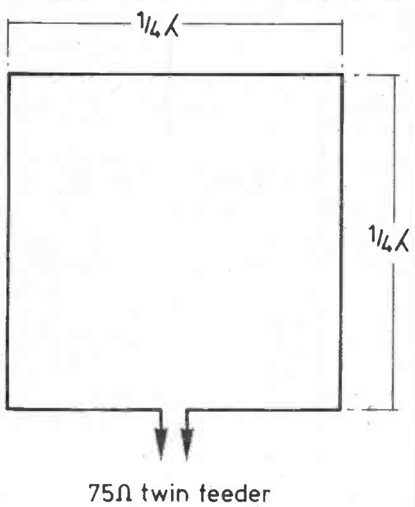

Fig. 1 The Quad Loop

My first experience with the quad loop aerial dates back to a desperate attempt on National Field Day to work some of the DX on 7MHz that had been missed by the club in its field day entries of previous years.

The quad loop was erected, suspended on a rope which was slung between two ladders, with its highest side about 45 feet above the ground. The lower part of the antenna was thus only 10-15 feet high. Also erected for 7MHz were horizontal and inverted-vee dipoles at similar heights. Thus, not only was it possible to assess the performance of the quad loop as a competitive aerial under the most severe of contest conditions, but its performance could be constantly compared with two other aerials.

At the Field Day post-mortem the following consensus was reached: the quad loop enabled us to work VK, ZL, and PY (Australia, New Zealand and Brazil) stations that were unworkable and in some cases inaudible on the dipoles. It was also noticeable that during daylight hours nearer European signals were much weaker on the quad loop as compared with the dipoles. However, the longer distant European signals, YU, UA's etc, were definitely stronger on the quad loop.

In consequence of the NFD results and after some thought, a three band quad loop aerial was made up and erected at my home for 14, 21 and 28MHz with the highest side at about 35 feet (see Figs. 2 and 3). I kept this most satisfactory set-up for some five years. Results on all three bands were very good to DX at right angles to the plane of the aerials — *consistently outperforming dipole aerials at a similar mean height by 1-2 'S' units.*

It is fair to ask why the quad loop produces signal reports, both on transmit and receive, that are upwards of 3dB better than the reference dipole at the same height when the quad loop has only a gain of approximately 1-2dBd? The answer is that the gain figure with reference to a dipole does not present the whole picture. The quad loop appears (although I have made no real measurements), to produce a much lower angle of radiation. I have found that DX stations may be worked with the loop when the path to a particular station is marginal, especially when the path is just opening or closing and often when contact is impossible

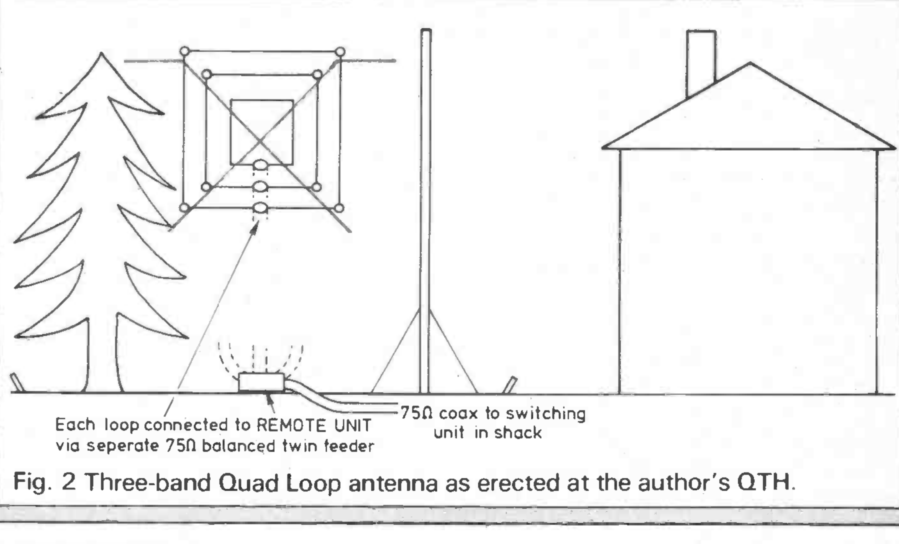

Fig. 2 Three-band Quad Loop antenna as erected at the author's QTH.