81 A simple 6 m beam

Introduction

The attraction of building your own aerials is an abiding feature of our hobby. You can *buy* almost any shape or size of aerial, but one you have made yourself can often work every bit as well as a commercial device costing ten times as much.

The design

This aerial, designed for use on the 6 m band, is essentially a two-element Yagi, with the elements bent in order to reduce the physical size. It is known

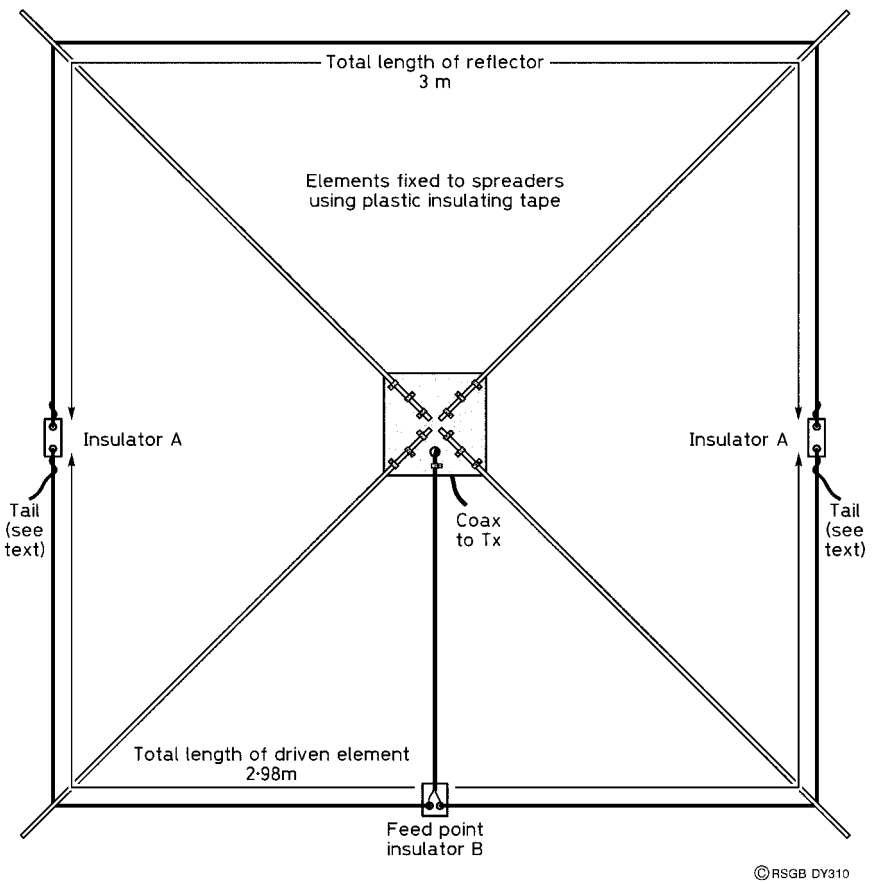

Figure 1 Plan view of the complete 50 MHz VK2ABQ antenna

as the VK2ABQ beam, and was designed originally for the 20, 15 and 10 m bands, principally because of its space-saving qualities. It is made using a wooden frame and wire elements, and is ideal for portable operation.

Tools ready?

The beam is shown in **Figure 1**. The driven element is the one whose centre is fed by the coaxial cable, and lies between the two insulators marked A and the feedpoint at B. The reflector is also anchored at the points A, and lies over the upper half of the frame.

The wooden centrepiece is used to support the cross-pieces and to mount the aerial on the mast, using a common shelf bracket. The cross-pieces, known as *spreaders*, can be wooden canes or dowelling, and are mounted to the centrepiece using cable clips and adhesive. **Figure 2** shows how this is done.

If the aerial is to be a permanent installation, the spreaders should be weatherproofed using a good-quality exterior varnish. The wire elements are PVC covered and fed through holes in the spreaders.

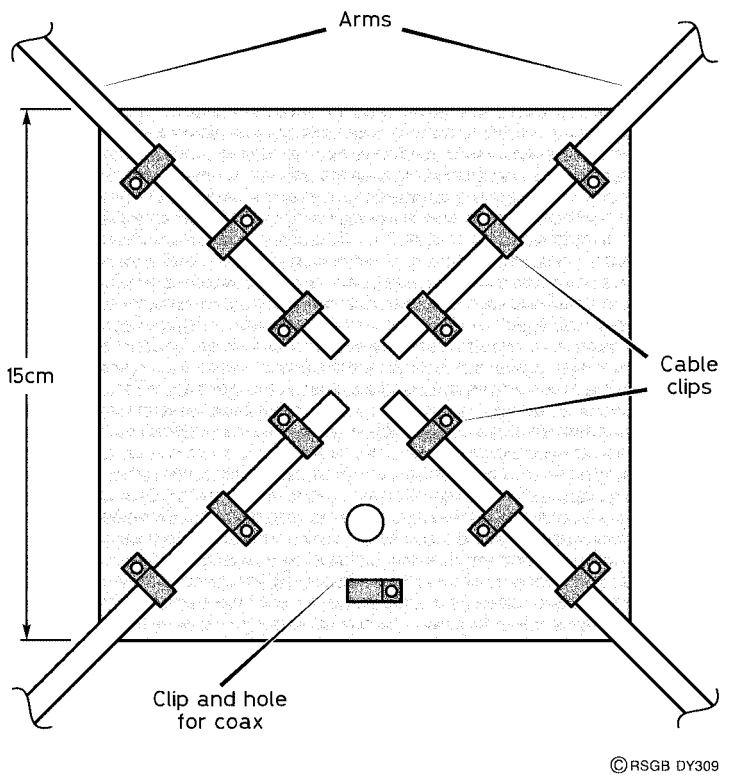

Figure 2 Centre support piece

The end insulators are made of drilled perspex, and the wire passed through the two holes and twisted, as shown in **Figure 3**.

Note: if you have not drilled holes in perspex before, take care! The drill bit must be well-lubricated because it generates a lot of heat (enough to melt the perspex and jam the drill). Never turn the drill for more than a few seconds at a time, and moisten the bit in between. Start with a pilot hole and use bits of increasing size until the hole is the size you want.

Another perspex insulator is used to secure the feeder to the aerial, as shown in Figure 3. The feeder then passes directly to the centrepiece, where it is fastened with a cable clip and then passes down the mast.

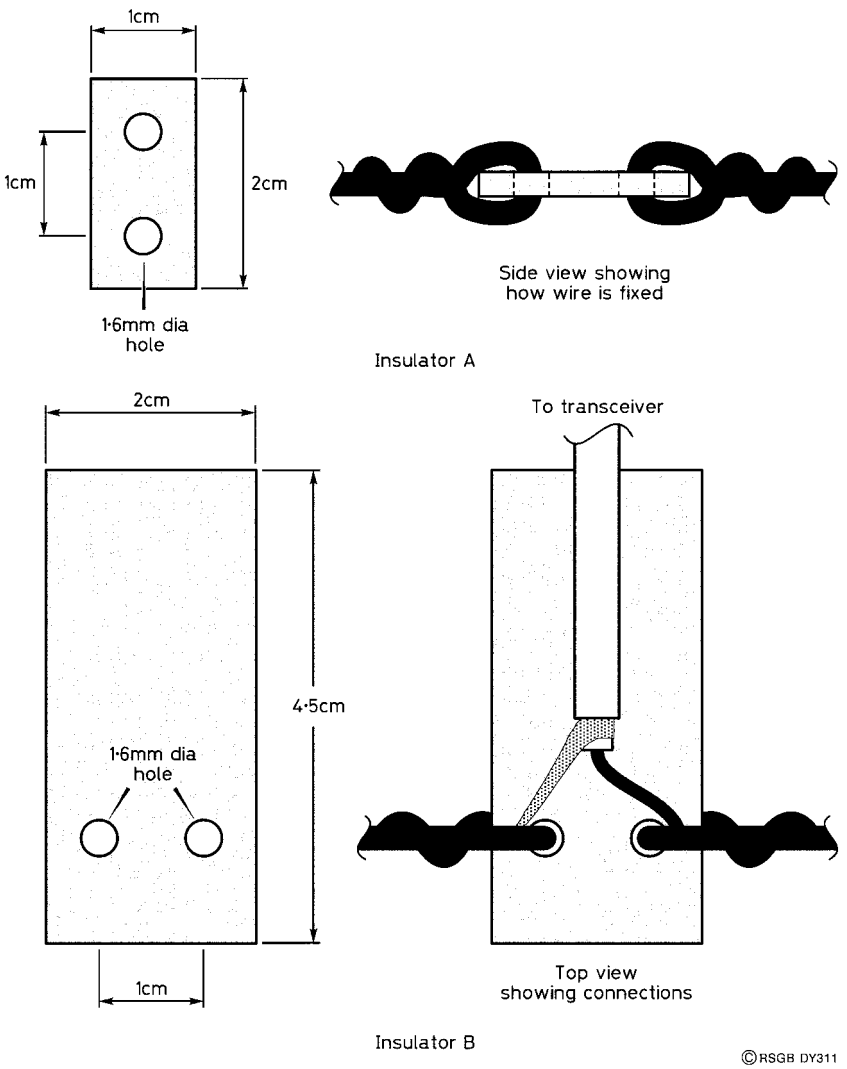

Figure 3 Details of insulators

Adjustment

The driven element (A–B–A) in Figure 1 is fixed to the end insulators in such a way as to have 'pigtails' which are about 10 cm long. Using an SWR meter between the aerial and the transmitter, trim the pigtails equally at each end for minimum SWR in that portion of the 6 m band in which you plan to work. Make sure that the transmitter is off when you trim the ends, as high voltages can be present there. Always listen on the frequency before you transmit and, when you do, ask if the frequency is in use and identify yourself. Use as little power as possible.

The prototype had an SWR of 1.2 at 50.2 MHz and performed well. If you look at Figure 1, which is a view of the aerial from above, you will immediately see that when the aerial is horizontal, it radiates with horizontal polarisation in a direction from the top of the page to the bottom. A metal pole or mast can be used for horizontal polarisation, but if you intend to use the aerial for vertical polarisation, it is much better to use a wooden or fibreglass pole.

Portable use

If you plan to operate portable with this aerial, the only real modifications you need are to the centrepiece and how it supports the spreaders. Instead of using glue and cable clips, nuts and bolts through the spreaders and centrepiece would allow the spreaders to be 'hinged' closed for transport.

Materials

Centrepiece	Hardwood, 15 × 15 × 25 mm
4 spreaders	110 cm long (cane or 6 mm dowel)
Wire	1.5 mm PVC-covered copper
50 Ω coaxial cable	RG58 or similar
Cable clips	6 mm (12 off)
Varnish	Polyurethane for waterproofing
Tape	Self-amalgamating, to waterproof all soldered joints
Insulators	See text