'SLIM JIM' for 28MHz

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Since the publication of my article on the "Slim Jim" omni-directional aerial for 2 metres, many readers have written about its possible use for the 28MHz (10 metre) band. Indeed, quite a number have already tried it for themselves by scaling up the dimensions, and have discovered that excellent results are possible.

It is appreciated that a version for 10 metres cannot be constructed to exactly the same format as that for 2 metres. The general configuration is the same, however, and a suggested design is shown in Fig. 1. For the benefit of new readers, and as a reminder to others, Fig. 1(a) shows the electrical behaviour of the aerial. It consists simply of a half-wave folded radiator, fed at one end from a quarter-wave stub which is used to obtain an impedance transfer from 50 or 70 ohm coaxial cable to the high impedance connection to the half-wave section of the aerial. Fig. 1(b) gives the required dimensions of the elements, which may be of heavy gauge copper wire (14 or 16 s.w.g. or multi-strand copper "aerial" wire). Tinned or enamelled wire would be preferable.

The main support could be a bamboo pole which is quite light in weight and strong, although finding a single pole this long is not easy. It might be possible to acquire a couple of the 15ft canes used to roll carpets on and join them end-to-end. Whatever method is used to join them (wooden dowel glued down the centres, or plastics water pipe used as a sleeve, are two suggestions), it will then be necessary to stay the pole at top and centre. The stays (three at each level, spaced at approximately 120° intervals) should be either of non-conducting rope, or of wire rope broken up with "egg" insulators. The lengths of the stay sections should be around one third of a wavelength (3·3m) and preferably not all exactly the same length.

An alternative way of erecting the aerial, if you have a couple of support points at around 10m above ground level, would be to suspend the "Slim Jim" from a stay run between them.

Small wood spreaders fitted with miniature stand-off insulators are used to support the wire elements. The feed cable can be 50 or 70 ohms impedance, and the correct tapping points to the stub section, about 300mm up from the bottom, are found by temporarily connecting the cable with crocodile clips, and moving them up and down until minimum v.s.w.r. is obtained. This should be less than 1·5 to 1. This adjustment can be made with the bottom of the aerial a metre or so off the ground, but standing vertically of course.

In a situation where there are a lot of buildings around, the operational height should be such that the bottom of the aerial is 3 to 5 metres above ground. The theoretical optimum vertical angle of radiation of about 15° to 20°, as in Fig. 1, is obtained when the centre point of the radiating section is about λ/2 above ground, but this applies only where the soil beneath has good conductivity and the aerial is situated in very clear surroundings. It would be worthwhile to experiment with height. Radiation is of course vertically polarised and omni-directional, but

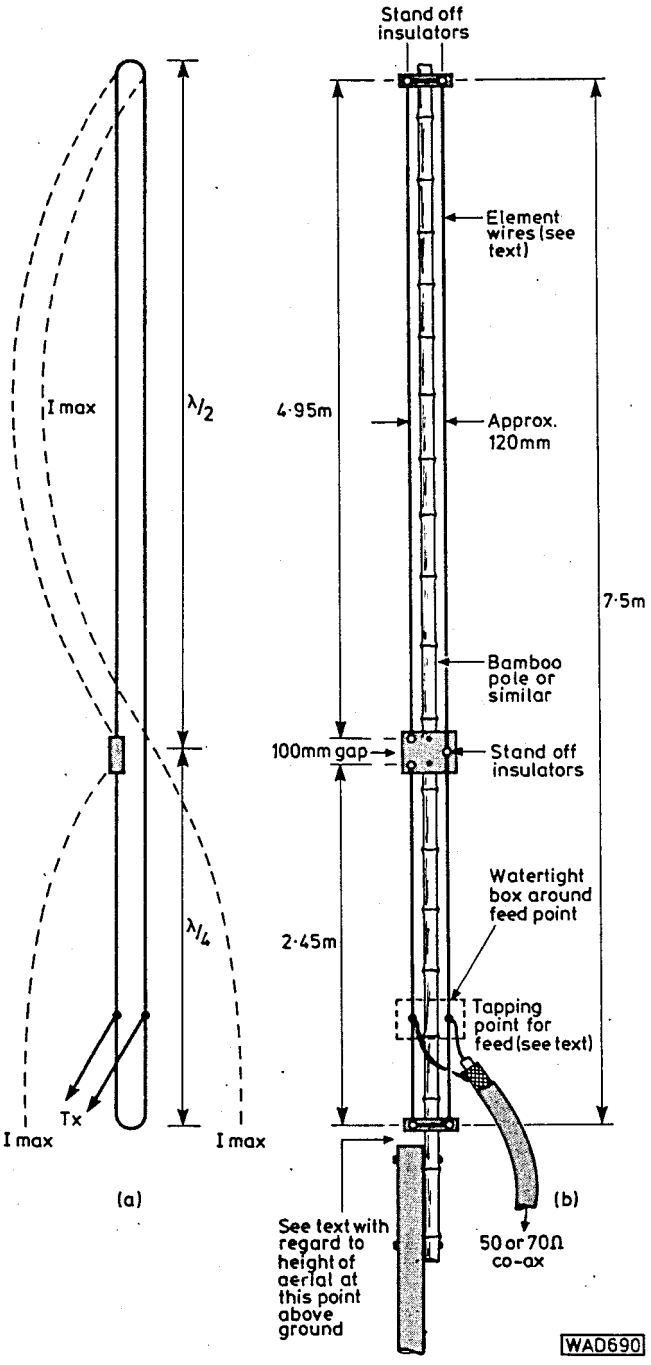

Fig 1: (a) Electrical function of the "Slim Jim" aerial. (b) Suggested method of constructing a "Slim Jim" for 28MHz (10 metres)

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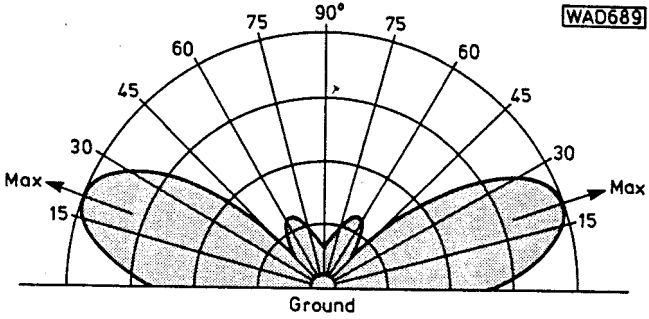

Fig. 2: Approximate vertical radiation pattern when the centre point of the radiating section is λ/2 above ground of good conductivity, and the aerial is situated in very clear surroundings

there is usually sufficient polarisation twist during long-range propagation to effect good transmission and reception to and from stations using horizontally polarised aerials.

One final note, make sure that the feed point is fully protected from rain water. A small plastics box could be used for this, with the element wires passing right through from top to bottom. A couple of coats of paint or varnish should be applied to the support mast and element spreaders. ●