Yagi design for its products. So it ought to be good enough for those of us in the ham radio fraternity.

Assuming it is (and write in and say if it isn't!) let us address ourselves in more detail to the above mentioned "...world's simplest directional antenna" to see what service it is capable of giving on the 2m and the 70cm bands.

First of all we shall need some dimensions. Let us start with those for the 144-146MHz band, accepting that this is where most home-built Yagis will be required. These dimensions lodge in the brain like one's motor car number or telephone number — or even like those dimensions you see displayed on a fashion page (if you ever read a fashion page) and they go like this: 36-38-40 inches. If that sounds a strange contour for a fashion page it is the ideal contour for a ham-built aerial.

"But there must be more to it than that?" you the reader may be excused for asking. There is, of course. The dimension of 38" is basic to 2m. It is the length of a half wave dipole. Double it to 76" and you have the dimensions of a folded dipole: to fashion it into one you simply bend it so that the top section is 38" long and the two other half sections come round to meet one another below it...well, not quite to meet one another; the two remote ends, now bent round almost to touch one another, are the feed point for you coaxial cable. **Figure 1** makes this clear. An insulated connection block is provided at this point.

The reader's next intelligent question will be: But what impedance of feeder cable? Fifty ohms, 75 ohms or what? Answer: whatever you like! By narrowing or widening space between the two limbs of your folded dipole you can persuade it to match into a variety of impedances.

In practice, almost certainly the constructor will be wishing to connect a length of the popular 50-ohm coaxial into his intended design of antenna. He will find that the folded dipole on its own will not like it; feed it in to a VHF transmitter and the latter will promptly shut itself down via the protection devices at its antenna output, simply because it is looking at an anomalous impedance.

'Electronic searchlight'

This, though, is but the first stage. The object of the exercise is to evolve a directional antenna, and **Stage 1** in this process is the bending up job. **Stage 2** is to mount the folded dipole at the centre point of an aluminium boom 40" long and to bolt a solder-tag to each of its inner ends to accept the feeder cable connection. **Stage 3** is to mount a single unbroken rod 40" long at one end of the boom and an unbroken rod of 36" at the other end. Space all three elements by 19" apart, and hey presto, the thing is beginning to look like one of those familiar roof-top TV aerials, only a bit bigger.

You now have a three-element Yagi ready to radiate just as soon as you have connected your feeder run to those two solder tags.

It is all so easy as to persuade the sceptical reader to ask: "There must be a catch in it somewhere". There is — but only a mild one. It is the final matching of the assembly to the transceiver into which it is to work. You already know how to do this: you were told above. You simply compress or strech the space between the folded dipole rods until the transceiver feeding the assembly delivers power into it without shutting down.

To perform this operation mount the antenna in the clear on, say, a temporary lowdown mast in the backyard where it will be accessible for adjustment. It should not fire into nearby obstructions: these can produce anomalous results. It would be somewhat frustrating to have adjusted the dipole element for what looked like optimum results at head height only to find that it was far from optimum at house height!

What we have talked about up to this point is the most basic three-element Yagi of all. To secure more gain from it, add another 36" rod ahead of your existing 36" director, or even a 35" rod ahead of that, to make it into a 5-element Yagi. Spacing each time will be 19", which means that you need to provide a boom 76" long, ie, a quarter wavelength spacing between each element, if you go for the 'five elly'.

You will notice that from these tapering dimensions directors get smaller the further away they are from the active folded dipole element, where it all starts. Visualise the whole structure as an electronic searchlight with the folded dipole at the focus of the 'mirror'. The 'reflector' of the mirror is our 40" rod reflector of the assembly.

Rods, rods...where to get them from? Aluminium curtain rail from your D-I-Y shop works excellently. Much cheaper is redundant TV aerial stock which may be bought (or even cadged) from television aerial installers whose names are to be found in any Yellow Pages or Thomson's Local Trade Directory. They often have a lot of it in their backyards recovered from ancient Band 1 and Band 3 405-line antennas.

If you *do* obtain your antenna materials other than new, be sure to give them a thorough furbishing, for two reasons: first, that RF power skates more readily along a smooth surface than along a corroded one; and secondly that if electrical contact between the various metallic surfaces of your aerial is not perfect then you are in effect interposing a small resistor between the joints. Remember, aluminium corrodes rapidly. Particularly at the point where you have affixed those solder tags to the radiating element do not fail to file and to polish clean before you bolt them finally to the inner ends of the folded dipole.

And so to the eventual evaluation of your electronic searchlight. The first thing you will need to ask yourself is: "Shall I mount it vertically or horizontally?". The question virtually answers itself: if the antenna is to be used for the FM traffic that dominates the 2m scene today then mount it vertically to render it reciprocal with the polarization employed by mobiles and by the 2m repeater chain.

But suppose you wish to try your arm at DX working in the lower half of the 2m band? In that area you will require horizontal polarization for long distance communication on both FM and on SSB — and indeed to CW if you are a Class A licensee who enjoys the winkling-out which may be done below 144.15MHz.

If, then, you wish to have the best of both worlds — and they *are* two worlds on 'Two' these days — you will need to build yourself two antennas, one disposed vertically and the other horizontally. If that represents too forbidding an undertaking, and if the pocket will stretch to it, purchase one of the excellent professionally-designed crossed