

if you are monitoring the calling frequency, you might not hear weak stations that are not exactly on your beam heading and thus miss a lot of the action.

A typical three element Yagi has a gain of 6dB. If you connect two together — with a suitable matching harness of course — the forward gain rises to 9dB, the same as for the single 6-element case. It might seem pointless to go to the trouble of phasing and mounting two aerials where the same gain can be achieved with one but there are real advantages.

Fig. 4 shows the polar plot of two vertically stacked 3-element Yagis. There are two points to note. Firstly, the horizontal plane radiation pattern indicates a beam width of at least double that of a single 6-element Yagi even though the realisable gain is the same. In practical terms, the array is not nearly so critical of beam heading. The other point is that the horizontal lobe characteristic does not differ markedly from a single 3-element array. The same is true of four or more tier systems. Fig. 5 shows that the beam narrowing occurs in the

vertical direction only. This is relatively unimportant since the array elevation will nearly always be parallel with the horizon. In other words the vertical stacking changes the beam from the pencil form of the single Yagi to a fan shape.

Yagi v quad

It is possible to treat these two popular types of aerial in much the same way. The only real difference is the extra 1.5dB of gain that a quad system will have over a Yagi array of the same number of elements. Against this, the quad aerial, element for element, has almost twice the metal of a Yagi. This increases the wind loading and weight. However, there are compensations. Long quads are supposed to be easier to match than long Yagis. The main point about quads though is that they give more gain for a given boom length.

There is one proviso to all these quests for gain. It is important to get optimum matching and phasing. It is very easy to lose hard won performance. Home built aerial designs are prone to this but little trouble

should be encountered with good quality professional units. Provided that the input SWR to the aerial is below 1.5:1 no significant performance shortfall will occur. Even system SWR's of 2:1 will not degrade performance particularly. Remember too that long feeders are lossy. UR67 or better should be used for all runs over about 20ft on 2m. 70cm requires UR67 for all runs over 8ft. I would personally recommend the new H-100 coax from W H Westlake. It has a much lower loss than UR67 yet costs just 80p/metre.



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