mobile operators on the metre-waves bless the day when repeaters were invented ('invented' in a manner of speaking: they were developed slowly but deliberately if only on account of the entirely new ground they were breaking and the entirely new technology they were deploying).

But those tens of thousands of *fixed*-station operators on the metre-waves detected (if they were at all observant) a deleterious trend behind all this. Because the mobiles and the repeaters went vertical, very many fixed stations did so too, installing at their home stations vertical omni-directional antennas either on grounds of cost, or "it's the thing to do... everybody else does", or for sheer failure to take thought of the consequences.

...and the consequence was

It is as well to spend a few moments considering what these consequences are. In the first place an omni-directional antenna at the home site radiates its power in all directions instead of solely in the wanted one. Secondly, the operator in the wanted direction receives a poorer signal from an omni than he would from a directional skyhook: any reader of any VHF textbook will know that the ERP (effective radiated power) from a directional antenna must be immensely greater than from an omni (postulating the same amount of RF applied at the base of each respective feeder).

But thirdly, and probably most important of all, the use of an omni on the 2m band may be regarded in today's conditions of increasing congestion as being positively anti-social. Granted that if you use a simple beam the man in the next suburb or the next village will still be able to detect your signal; but it will be much attenuated to him by contrast with how it would sound if it were coming off an omnidirectional system. And you will contributing to the orderliness of the band — and adding to the pleasure of others who wish to use — by reducing the size of your signal in all *un*wanted directions and increasing it in the *wanted* ones.

There is one circumstance where omni-verticals come into their own at a fixed site (if readers can think of any others your scribe will print them here). This circumstance is *net operation*, where a scatter of stations at random QRBs (remember?) and bearings from one another wish to talk together. Then the use of an omni is inescapable. What might be added is that nets should preferably conducted in a clear part of the 2m band, say below 144.9MHz, and never but never through repeaters.

Getting oneself directional

The reader who accepts the thesis that it is a good thing to put one's signal where one wants it to go, rather than to scatter it wastefully, will by now be cogitating how best to go about achieving this desirable condition.

To riffle through the numerous antenna designs offered by the media and the ham radio textbooks may throw him into a state of such confusion that he will end up by thinking "Oh, it's all too difficult...let's stick to the omni with all its faults". Understandable — but unforgivable, because (a) he is abrogating his responsibilities to his amateur community by inflicting on them a QRM level that would be abated if he 'went directional', and (b) the world's simplest but most effective directional antenna may be his for the asking — or at least for the making, should he so choose. It is...guess, wait for it, *a common or garden Yagi*.

Didn't Mister Yagi evolve his first antenna way back in the Twenties when its possibilities for metre-wave applications went unrealised simply because the state of the electronic art was too rudimentary in those days (come to that, there was no electronic art: the word 'electronics' hadn't been born)? Answer to question. Yes, he did. And hasn't the Yagi design proved itself to be easily the most popular of any, despite fashionable upstarts that attempt to deny its virtues from time to time? Answer to that one: Again, yes.

How do we know? What support can we offer for what many may read as a somewhat dogmatic utterance? Answer: Look at any housetop, spot the colour-television antenna, remind yourself that the TV aerial industry with its task of catching uhf signals for twelve million homes, almost overwhelmingly uses the

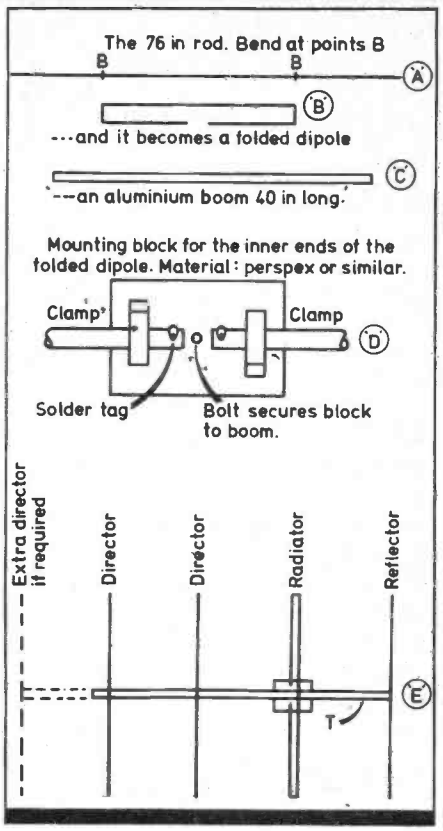

Fig 1 showing the construction of a basic Yagi antenna for 145MHz.

At "A" the 76" aluminium rod, its ends to be bend inwards at Points B.

At "B", how the single rod becomes a folded dipole.

At "C", an aluminium boom 1", diameter will be 40" long for a three-element Yagi 58" for a four-element, or 76" for a five-element, spacing between each element 19".

At "D", a flat block of insulant such as perspex or similar accepts each of the bent back ends of the folded dipole. It is firmly bolted to the main boom. The inner conductor and the outer braid of the coaxial feeder cable are soldered to the tags mounted at the inner ends of the folded dipole; the cable is then taped to the main boom.

At "E", the finished antenna. The feeder cable is to be taped to the main boom at "T" to avoid pulling stresses.

Answers to Practice RAE

Paper 1

1 d, 2 b, 3 a, 4 b, 5 d, 6 c, 7 a, 8 a, 9 b, 10 c.

Paper 2

1 d, 2 a, 3 d, 4 b, 5 c, 6 c, 7 c, 8 a, 9 d, 10 g, 11 a, 12 b, 13 b, 14 d, 15 c.