



COLLECTED AND DESCRIBED
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SMALL HF TRANSMITTING LOOPS

THESE SO-CALLED 'MAGNETIC' antennas have taken decades to become popular among amateurs. By 1968, a US Army development reported by K Patterson had been 'amateurized' by McCoy, W1ICP, and Hart, W5QJR, commented on by our own Pat Hawker, G3VA, and theorized and tried out by 'Spenny', G6NA. Thereafter, almost nothing until the mid-'80s.

Four manufacturers exhibited such antennas, including Capco from the UK. One firm, *Chr Kaerlein*, DK5CZ, stood out because of the variety of both its professional models with automatic tuning unit and its amateur models which have diameters of 3.4, 1.7 or 0.8m. Each loop can be fitted with a variety of single or split-stator tuning capacitors to produce 21 different combinations of size, frequency range (up to 6:1, between 1.75 and 30MHz) and power capability (100-500W), all beautifully catalogued (Fig 1).

I noted interesting differences between DK5CZ's booklet and W5QJR's writing in the *ARRL Antenna Book*, 15th (1988) edition, the best DIY guide I know of on this subject.

● **Tuning capacitors:** W5QJR says: "A vacuum variable is an excellent choice, provided one is selected with adequate voltage rating". DK5CZ states that the high loop currents heat and thereby distort the thin metal in vacuum capacitors and consequently detune the loop. He has designed air-dielectric capacitors which, in spite of their thick, widely spaced plates and massive contact areas to the loop, have such a low minimum capacity that a tuning range exceeding 6:1 is obtained.

● **Tuning motors:** While recognizing the need for high resolution, W5QJR recommends a stepper motor with integral gear train. DK5CZ found that even with a stepper motor with 0.1° resolution, best SWR sometimes required tuning between adjacent positions; he uses DC motors.

● **Earth:** W5QJR calculated that a ground plane of radials two loop diameters long creates below a vertical loop a ground image which effectively doubles the area of the loop

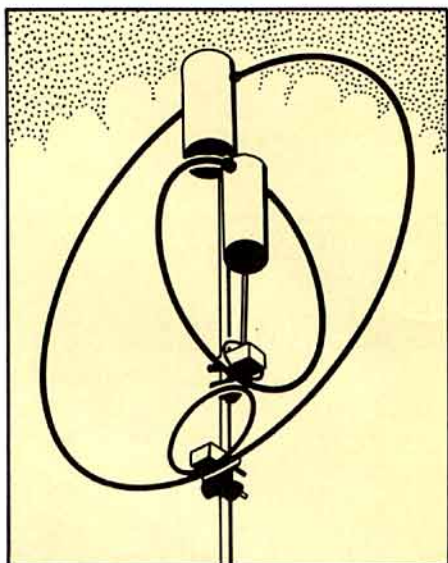


Fig 1: Two tunable magnetic antennas at right angles on one mast cover all amateur bands, 1.8 - 30MHz.

'HAM RADIO '91', the international meeting and exhibition cum flea market of the German amateur radio society DARC at **Friedrichshafen** on Lake Constance (of pre-WWII Zeppelin fame), was this year's biggest European amateur event; Erwin David looked for things not seen at UK shows.

and enhances its efficiency; he specifies each size of loop with and without radials. DK5CZ recognizes no such advantage of a ground plane and specifies the gain of his antennas mounted vertically at 10m above earth.

A *Annecke*, DJ6OO, has introduced another solution to the capacity-range/tuning-resolution problem: **interchangeable one-band loops** attached to a single mounting with tuning capacitor and its remote control unit. This capacitor has a range of 55 - 62pF, 13%, which will tune the whole 6%-wide 10m band and more than the width of the 12, 15, 17 and 20m bands for which loops are also available. This does away with the wide capacity ratio required to tune continuously a frequency range exceeding 2:1 and the need for a high-resolution remote tuning mechanism. All components can be bought separately, or as a kit or complete system.

A WIDE-BAND HF VERTICAL

K H MUEHLAU ANTENNENBAU claim that their 8.45m high *slimline* antenna provides low-angle radiation (12 - 17°) when erected near level ground at an SWR below 2:1 over the continuous range of 3.5 - 30MHz without traps. It looks like a sleeve dipole of which the upper radiator is only approx one third the length of the sleeve, the latter being flanked by four radials, each of different length and shorter than the sleeve. No additional radials are required (Fig 2). Rated for 250W, (500W PEP), no efficiency figures are given. The antenna can be easily taken apart and reassembled for transport.

VHF/UHF ANTENNAS AND AN AMPLIFIER

DIRECTIONAL DUAL-BAND ANTENNAS are not common in the UK, but here two configurations from the Japanese manufacturer

Maspro were offered by *Bogerfunk*. One has a 2.13m high radiator said to be $2 \times \frac{5}{8}\lambda$ on 145MHz and $5 \times \frac{5}{8}\lambda$ on 435MHz, with three radials, and two sets of stacked reflectors, one for each band (Fig 3). The horizontal pattern in the ad shows a not-very-deep null off the back on 435MHz and none on 145MHz.

The other antenna looks like a Yagi with a two-band radiator and separate parasitic elements, all on one 1.35m boom (Fig 4). A stacking kit is available.

The same dealer offers a dual-band both-ways amplifier from *Tokyo-Hi-Power* for use with dual-band hand-helds: 0.3 - 5W in, 30W out on transmit; 14dB gain on receive. With automatic band and T/R switching it is suitable for cross-band duplex.

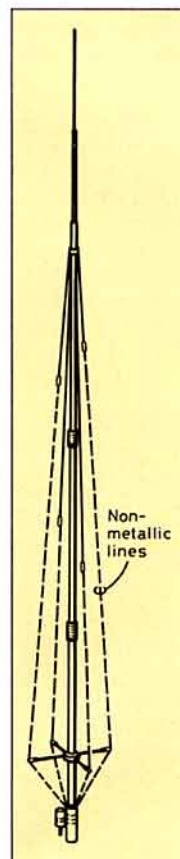


Fig 2: (Left) A wide-band vertical, 8.45m tall, provides low angle radiation with an SWR < 2:1 from 3.5 to 30MHz.

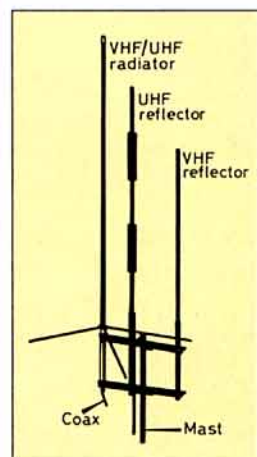


Fig 3: (Above) Separate 145MHz and 435MHz reflectors added to this dual-band vertical collinear give extra gain but no sharp null off the back.

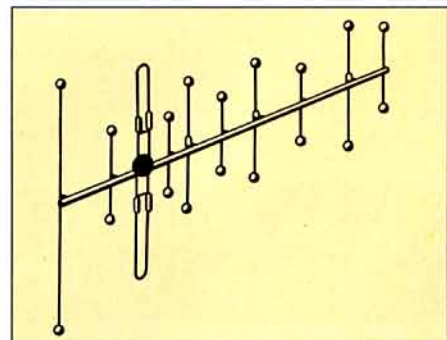


Fig 4: 145/435MHz Yagi can be used horizontally or vertically, singly or stacked.

DL4KCJ, trading as *SMB Elektronik*, from whom I bought a dual-band collapsible log-periodic several years ago, now offers a very simple dual-band antenna; an extra 435MHz $\lambda/4$ rod is 'planted' on the ground plane centre of a 145MHz ground-plane vertical. For

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