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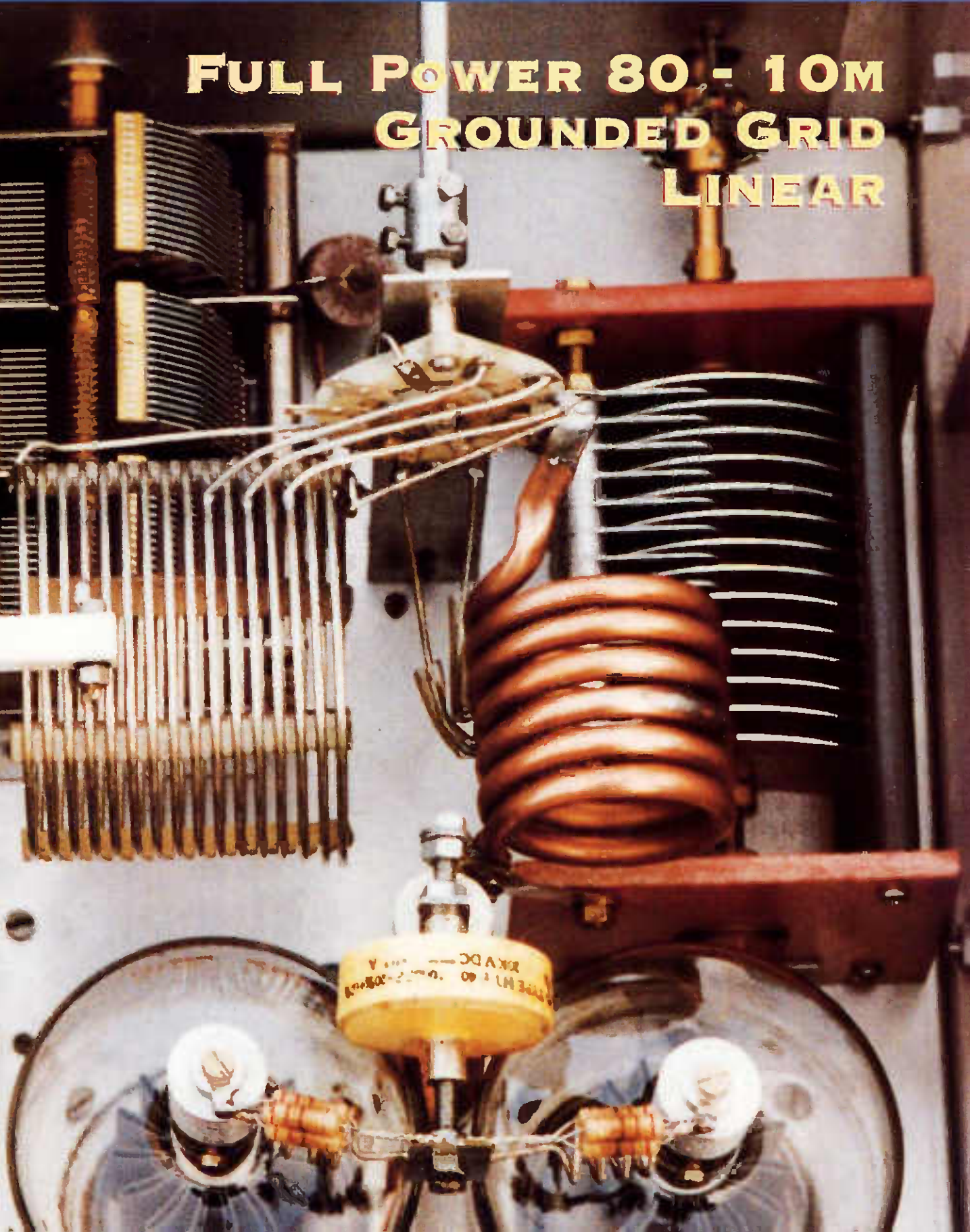
The Journal of the Radio Society of Great Britain



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FULL POWER 80 - 10M GROUNDED GRID LINEAR

THE VOICE OF AMATEUR RADIO FOR 84 YEARS



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TRANSLATED AND EDITED
BY ERWIN DAVID, G4LQI

MEIGHT is not a spelling error - it is a contraction of *Magnetic Eight*, the type and shape of an antenna developed by **Frits H V Geerligs, PA0FRI**, and presented in *Electron (NL)* 1/97.

MUCH HAS LATELY been published about magnetic antennas. Their performance on the air often belies their low theoretical efficiency [though, with a loop circumference approaching $\lambda/4$ and good construction, the efficiency-to-size ratio is not all that bad - *G4LQI*]. There remains the narrow bandwidth, which often requires elaborate tuning provisions.

Frits thought that two loops in parallel might bring relief and tried it on 145MHz, a size very convenient for experimenting. The one shape that worked was the figure-8 shown in **Fig 1**, with a preset capacitor resonating the double loop and mechanically separating the two conductors at the cross-over.

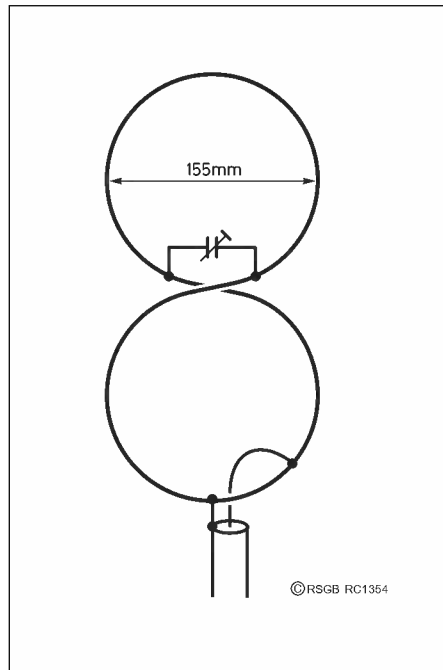


Fig 1: PA0FRI's Magnetic Eight antenna.

MATCHING TO 50 OHMS

FRITS TRIED TO MATCH the antenna to a 50Ω coax feeder with the usual coupling loop and with a gamma match. Neither satisfied him. He then had the idea of combining the two; it worked, and he dubbed it *Combi-match*. See **Fig 2**.

CONSTRUCTION

THE DOUBLE-LOOP WAS shaped from a 1m length of 3mm diameter brass welding rod, but using thicker copper tubing may increase the efficiency. A can with an approximate diameter of 12cm makes a good bending jig. The loop was closed at the bottom by soldering the rod ends into a short sleeve.

The tuning capacitor is a 10pF ceramic piston trimmer, which is adequate at a power of 10W. See **Fig 3**. For outdoor use, some kind of weatherproof enclosure for the trimmer will be required.

One antenna was mounted on a short length of angle profile which also carries a BNC socket; the assembly was then cemented onto a magmount for mobile use. In another version, the rod ends were soldered into holes drilled into a BNC plug for direct installation on a handheld transceiver.

The Combi-match is also made of brass rod, but only after the attachment point on the loop has been established with one made of soft copper wire; it turns out that the precise attachment point for best SWR de-

pends on the way the BNC connector is mounted.

TUNING AND TESTING

ADJUST THE TRIMMER with a non-metallic tool and find the precise attachment point of the Combi-match for unity SWR at the operating frequency. The 2:1 SWR bandwidth is around 1MHz. Polarization is exactly vertical. The azimuth radiation pattern is a figure-8, with very narrow nulls. Surprisingly, the nulls are not noticeable in mobile operation; in fact, flutter seems to be less bothersome than with the usual mobile whip.

Efforts to use a second antenna as a parasitic element to change that pattern were unsuccessful. [Who will experiment with all-driven arrays? It works with small (ie magnetic) receiving loops [1, 2], so why not for transmitting? It may be easier to do such experiments on lower frequencies where amateur test equipment is more accurate - *G4LQI*. Frits [3] also would like to hear from anyone who has tried a Combi-match and/or a Meight antenna on a lower frequency.

REFERENCES

- [1] *A High-Directivity Receiving Antenna for 3.8MHz* by Floyd Koontz, WA2WVL, QST 8/93.
- [2] *A Directional Active Loop Receiving Antenna System* by J A Lambert, G3FNZ, *RadCom* 11/82 and *HF Antenna Collection*, (RSGB).
- [3] Beverdam 89, 4874 KT Etten-Leur, Netherlands.

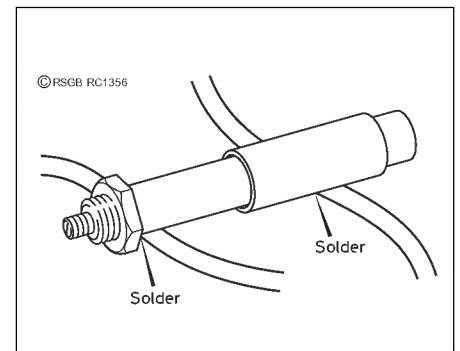


Fig 3: A ceramic piston trimmer capacitor resonates the double loop.

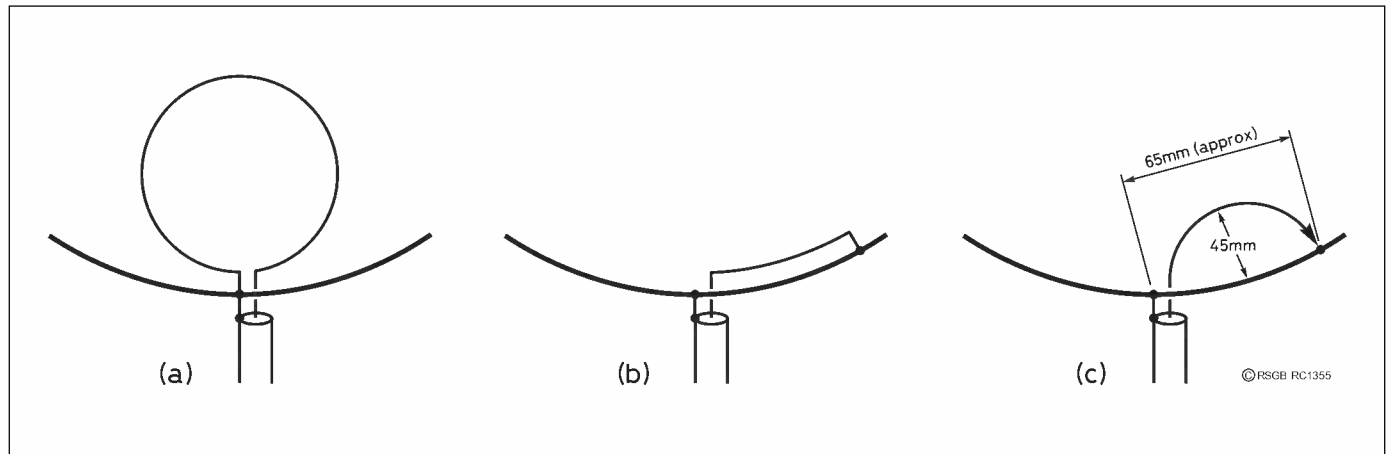


Fig 2: PA0FRI's Combi-match (c), is a hybrid between a coupling loop (a) and a gamma match (b).