Full Power 80 - 10m Grounded Grid Linear
THE RADCOM LEADER
General Manager Peter Kirby, G0TWW, says “We’re fighting back”.

RADCOM NEWS
Annual ITU Event Focuses on Humanitarian Aid • LF Distance Record Extended • Note from Dee Communications • RSGB Morse Test Anniversary • Yeovil QRP ‘Funrun’ • New Russian Amateur Satellite • WACRAL Lightship • Scottish Competition ’97 • AKD Target HF3 Receiver • Newport ARS Coach Trip • Stolen Equipment • Meet the RSGB • VHF/UHF Award News • NFD Registration • Members’ Advertisements • FT-50R for £250 • RSGB Diary Competition • Microwaves Correction • Direction Finding • Leicester Show • EMC Co-ordinator • Licence Changes - Gazette Notice Published

YOUNG AMATEUR OF THE YEAR
Backpacking Summertime Delights
The RSGB Backpackers contest season starts this month with the first 144MHz event. Tony Jarvis, G6TTL, enthuses about these VHF events.

AMATEUR RADIO FOR DISABLED PEOPLE
How amateur radio can be the perfect hobby for disabled people. Plus what the RSGB is doing for disabled amateurs.

TRANS-GREENLAND EXPEDITION 96
Blind radio amateur Terry Robinson, G3WUX, describes his attempt to cross Greenland as part of an integrated able-bodied / disabled team.

HIGH-POWER 3-500 HF LINEAR AMPLIFIER
In the first part of his article on an eight-band linear amplifier, Don Pinnock, G3HVA, describes the design and mechanical construction.

THE PHASING TRANSCIEVER ON 73kHz
John Hey, G3TDZ, describes how his Phasing Transceiver (RadCom July and August 1993) can be modified for 73kHz.

EUROTEK
PA0FRs’s Magnetic Eight antenna was described in Electron (NL) 1/97. Translated and edited by Erwin David, G4QLI.

IN PRACTICE
Balun with a Dipole • VHF Mobile Whips • Coax - Inside and Out

SWR MODULE USING AUDIO TONES
Adjusting an ASTU can be a problem for visually-impaired or blind operators. This project is described by David Berry, G4DDW.

TECHNICAL TOPICS
Electronic Centenarian • HF Receiver Measurements & Operability • Overvoltage Protection • Improving Simple Spectrum Analysers • A Small Direct-Reading VHF SWR Meter • RCCBs and PME • Ball Gate Arrays.

NEWS FROM AMATEUR RADIO'S NEWCOMERS
Compiled by Esde Tyler, G0AEC.

SAFETY, OPERATING PRACTICE AND THE LAW
Nick Negus, G6AWT, gives some sensible safety advice to those wishing to demonstrate amateur radio to the public.

AN ABSORPTION WAVEMETER
This useful instrument by Ian Keyser, G3ROO, can be used for checking transmitters, oscillators and antennas.

COVER PICTURE:
A detail of Don Pinnock’s, G3HVA, high-power 3-500 HF linear amplifier. See the lead feature starting on page 16.
MEIGHT is not a spelling error - it is a contraction of Magnetic Eight, the type and shape of an antenna developed by Frits H Veerlaghs, 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 l/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.

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 depends 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.

Figure 1: PA0FRI's Magnetic Eight antenna.

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

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

References