

CAPACITIVE ANTENNAS

FOR 40m, 30m AND 20m

After all the impressing results with my Magnetic Loop Antennas I was curious about the results with antennas at the other side of the L/C-Ratio: **Capacitive Antennas**.

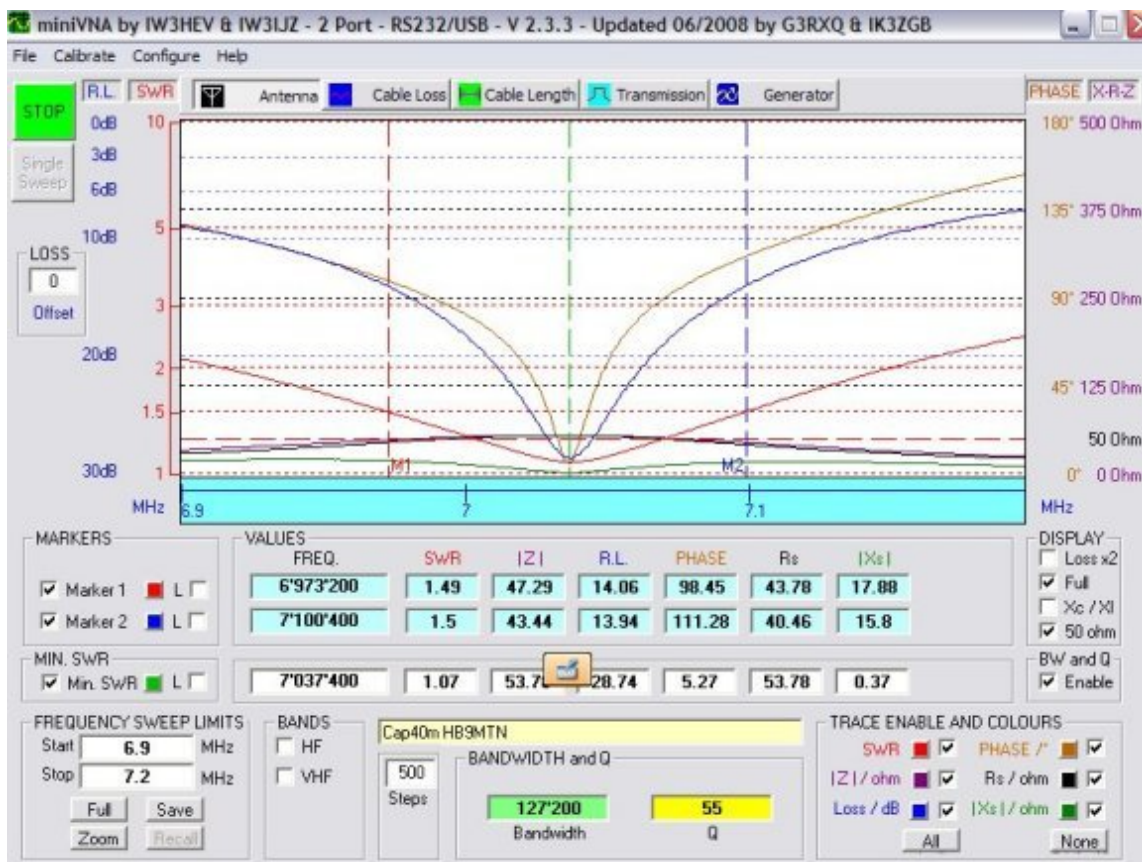
I came across the homepage of [Arthur, DL7AHW](#) and after some e-mails forth and back I adopted his formulas.

The components from "space" to TRX in my setup are:

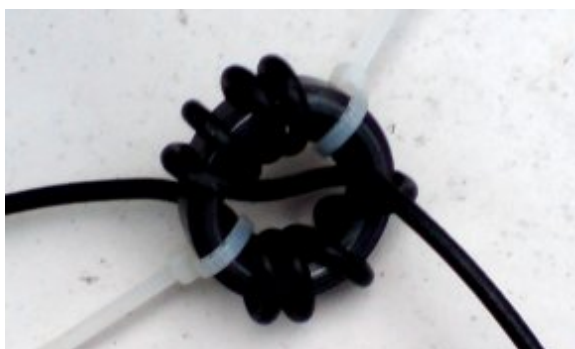
- **Capacitor**, aluminium household foil, 440mm high on PVC tube, 53mm diameter x 1.8m
- **Inductor coil**, 48 [26 for 30m, 15 for 20m] turns of solid installation wire below capacitor
- **$\lambda/4$ Coax from Coil to RF-Choke**, inner conductor connected to coil, sleeve open (!)
- **RF Choke**, 8 turns RG 174 on Amidon FT 114/43 (W1JR-style)
- **Coax**, any length to TRX



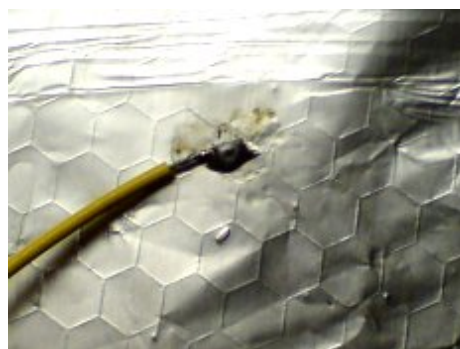
Cap-Antennas for 30m and 40m on my terrace



Analysis of Cap-Antenna, note excellent SWR (red line) and 1.5:1-Bandwidth (M1-M2)



RF-Choke (RG-174 on FT 114/43)
soldered!



Aluminium Foil can be

soldered!

Soldering of aluminium household foil

Aluminium foil can be tinned by scratching off the oxide layer from the foil with the well tinned tip of the soldering iron and applying plenty of tin at the same time. There is a squeaking sound like writing on a blackboard with chalk and suddenly the tin begins to bond to the foil. Then any conductor can be soldered to the tinned patch on the foil. That's it!

My Cap-Antenna performs somewhere between a dummy-load and a full size 4-element monobander for 40m [30m], but much closer to the latter, as I never had QSO's with N2, YO, OZ, IZ8, PJ4, OM etc. with my dummmmy-load!



It is hard to believe, the Cap-Antenna is a **center-fed dipole**!
Have a look at the US Patent # 2,485,457:

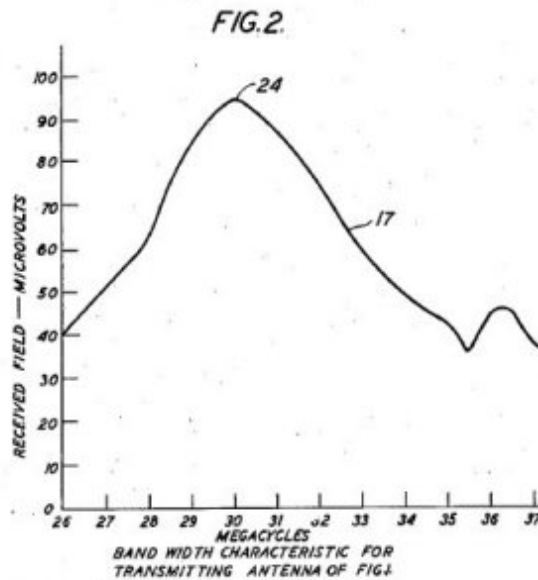
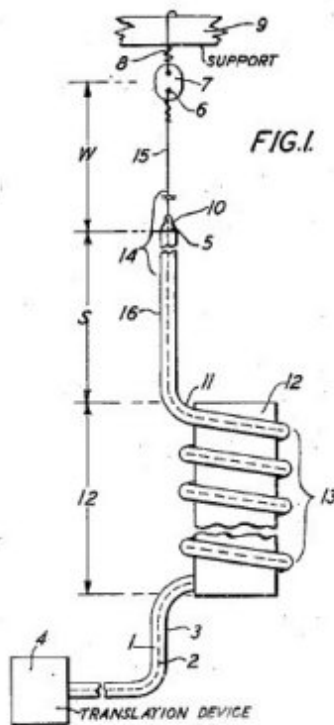
Oct. 18, 1949.

R. K. POTTER

2,485,457

ANTENNA SYSTEM

Filed Oct. 20, 1944



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Referring to Fig. 1, reference numeral 1 denotes a coaxial line comprising an inner conductor 2 and an outer conductor 3. The line 1 is connected at its near end to a translation device 4, such as a very high frequency transmitter; and the portion of the line adjacent the remote end is vertically positioned. The inner conductor 2 extends above and beyond the extremity 5 of the outer conductor 3 a distance W approximately equal to a quarter wavelength at the means or design operating frequency. The extremity 6 of the inner conductor 2 is secured through insulator 7 and guy wire 8 to the supporting member 9; and the outer conductor 3 is supported at its extremity 5 by insulator 10 and the inner conductor 2. At a point 11, located at a distance S approximately a quarter wavelength below the extremity 5, the line 1 is bent or coiled about the tubular insulator 12 so as to form a multiple turn impedance coil 13. As explained below, the section 14 of line 1 extending above point 11 and comprising the exposed inner conductor section or "whip" 15 and the outer conductor section or "skirt" 16 functions as a dipole antenna over a broad frequency range.

The components from "space" to TRX in his setup are:

- **W**, upper half of dipole (in my setup $\lambda/4$ L/C-radiator)
- **S**, lower half of dipole (in my setup $\lambda/4$ Coax between coil and RF-Choke)
- **I2/I3**, RF-Choke (as in my setup)
- **I**, Coax, any length to TRX (as in my setup)



The arrow indicates the RF-center of the dipole (#5 in Fig.1 of the Potter Patent)

About the radiation of the open ended coax

I measured the RF-current by means of the [MFJ-854 RF Current Meter](#) and found no current at the RF choke and maximum current at the screw terminal (red arrow), as expected on one leg of a dipole. Contrary to other statements on that subject, the shield of the coax radiates!

If the choke and part of the coax is laying on the ground, the coax has to be coiled up near the choke to compensate for the capacitive load.



Coiled coax at antenna side of choke

Cap-Antenna Calculator

Links to Cap-Antenna sites

<http://www.dk3red.homepage.t-online.de/de/s6d.htm>

<http://dl7ahw.bplaced.net/Superantenne00E.htm>

<http://www.hamradio.hr/9a4zz/>

<http://www.hamradio.hr/9a4zz/files/9A4ZZ%20BIPOL%20ANTENA.pdf>

<http://db0smg.afug.uni-goettingen.de/~dl2abc/crov/vorw.html>

<http://db0smg.afug.uni-goettingen.de/~dk1rm/hardware/kvert.html>

This page is under construction, for more information contact: hb9mtn@qsl.net

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