

The Isotron

Another antenna of reduced size, without tuning. (click on the image on the left, link towards ISOTRON). On 40 and 80m band, it is made of two plates into v whose angles are connected by a coil. The whole is rather compact.

Here the description of a home made realization for the 40m band.

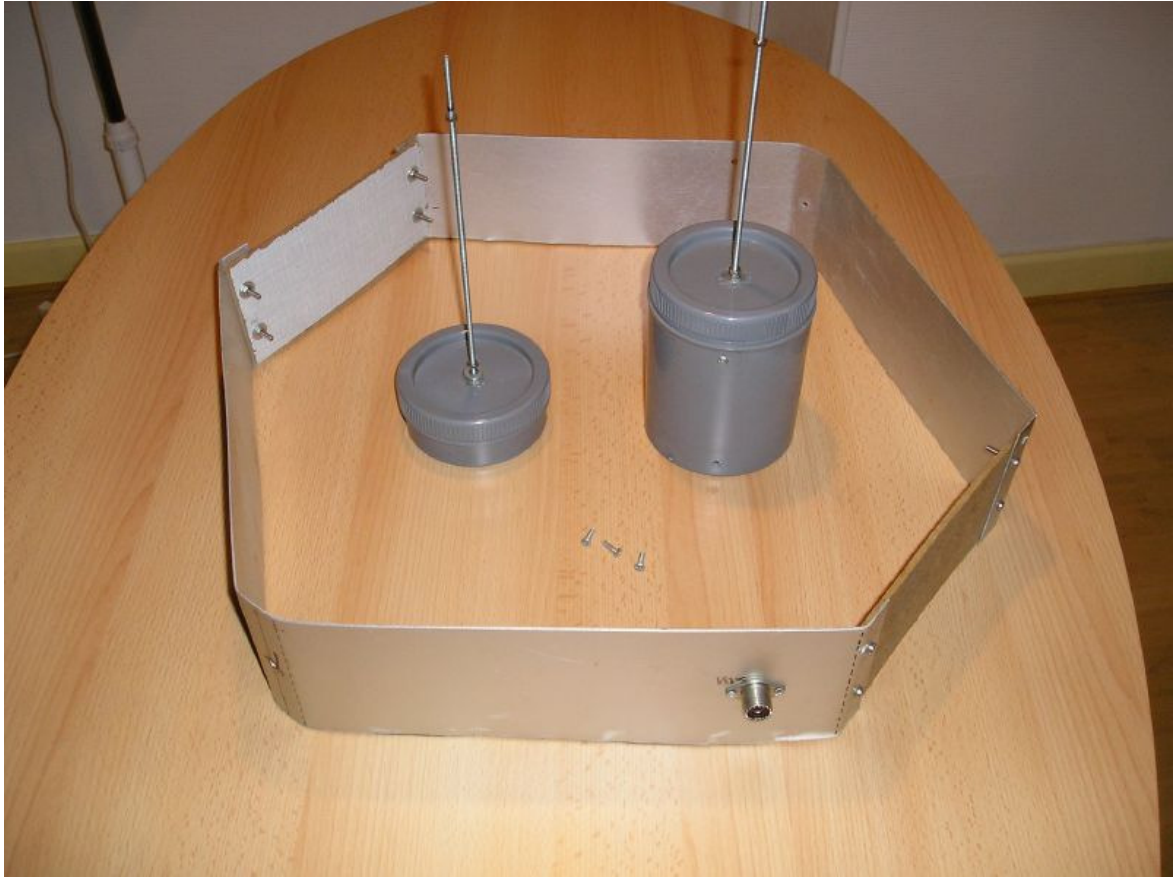
Supplies and dimensions

- 2 rectangular aluminum sheet 67,5cm X 10cm (26.57 x 3.94 in.)
- 2 threaded rods diameter 4mm (0.15 in.) , L=27cm (10.63 in.)
- Wire H07_V-U 2,5mm² (0.004 sq in.), 8m (26.24 ft.) rigid or flexible (coil)
- Wire H07_V-U 2,5mm² (0.004 sq in.), flexible, 1m (3.28 ft.) (coupling coil)
- A small length of coaxial RG58-U (what to connect the coupling coil to the SO239 while allowing him a sufficient vertical clearance)
- 2 plexiglass rectangles (or other insulating) 20 X 9cm (7.87 x 3.54 in.)
- 8 bolts 4 X 20 (0.15 x 0.78 in.) with discs (fixing insulators above)
- 1 gray pvc coupling diameter 100mm (3.94 in.) (its length makes approximately 11,5cm or 4.52 in. - or portion of tube PVC)
- 2 cleanout with plug for diameter 100mm (3.94 in.) (stoppers). It will be fixed on the coupling by 3 screws.
- 6 screws 4 X 15 (0.15 x 0.59 in.) (to fix the stoppers on PVC).
- (In the case of use of the elements above, the coil support thus created will make a length of 16cm or 6.3 in.).
- adhesive tape to maintain in place the coil wound once (the last whorls will be stuck once the tuning obtained)
- adhesive cyanolite
- 2 wire connectors with hole of 4mm (0.15 in.)

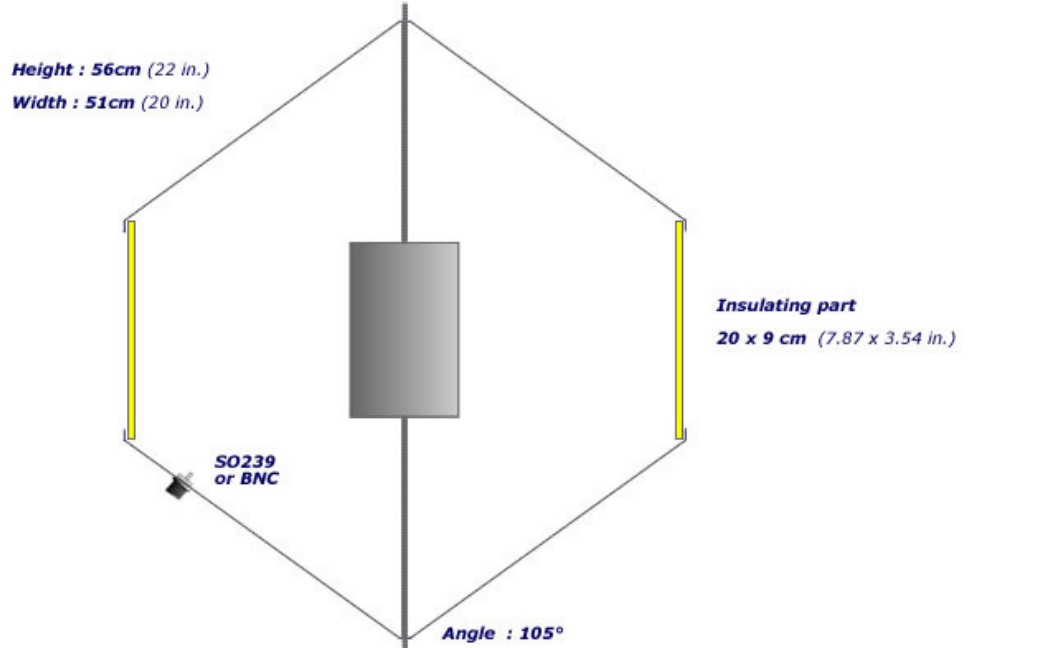
Preparation

First of all, the plates will be bored, folded and fixed, using plexiglass sides. That form the frame of the antenna.

Make sure that no insulating film remains on the plates so that the contact with the threaded rods is assured correctly. Then, self will be fixed on frame.



Frame of the antenna



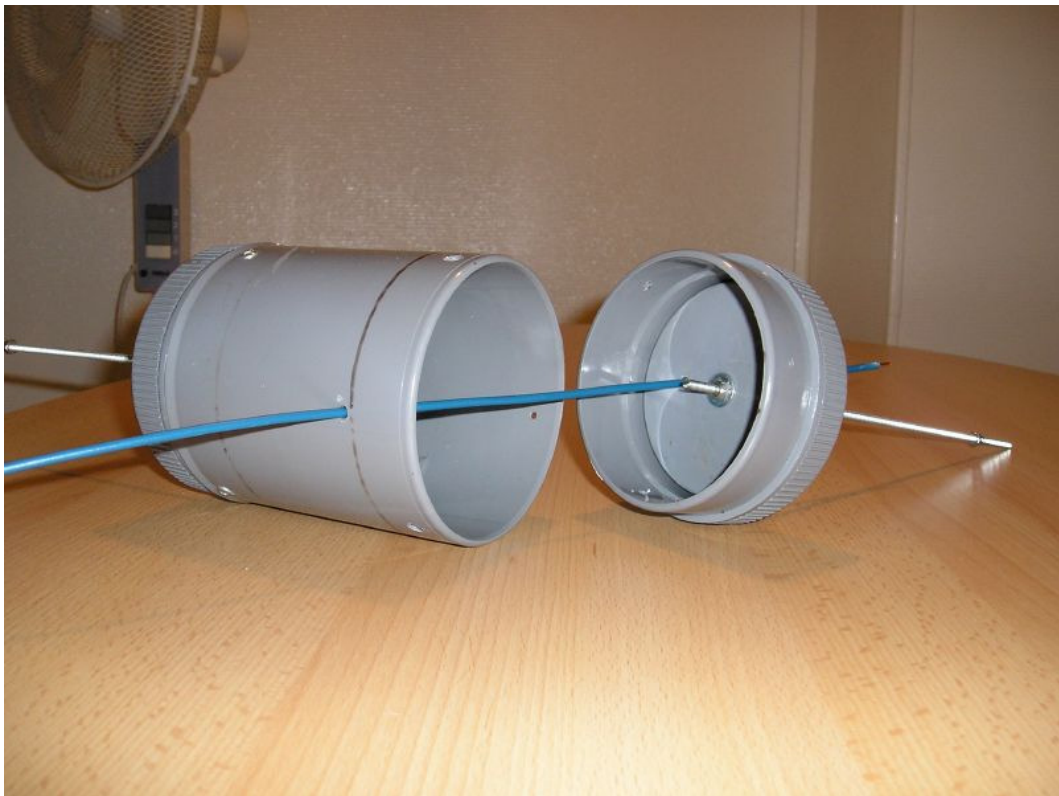
Plates : Length 675 (26.57), width 100 (3.94). Sizes in mm (inches)

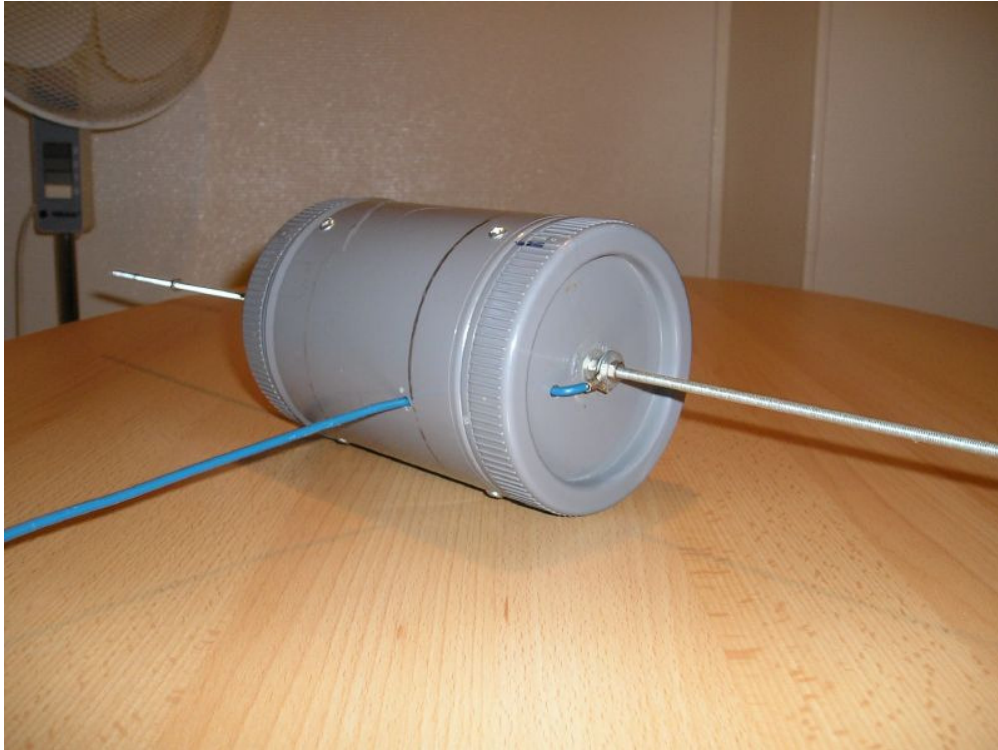
25 (0.98)	300 (11.81)	25 (0.98)	300 (11.81)	25 (0.98)
•	• SO239 Diameter 16 (0.63)	•	• For threaded rods and insulating parts : 4mm (0.157)	•

Opposite, the drawing specifies dimensions. The angle in the center of the plate (without holding account of the dish of 25mm or 0.98 in.) is of 105° whereas that of the reductions located at the ends and falling to the vertical is of approximately 128°.

Once the antenna finished, it will have a width of 51cm (20 in.) and a height of 56cm (22 in.), plate to plate. Both aluminum sheet rectangles are formed, bored. The lower plate is provided with its jack SO239 (or BNC). The insulating parts are fixed at the plates thus finishing the assembly of the frame of the antenna.

Coil support





Bore the stoppers in their center, diameter 4mm, and fix an end of threaded rods, firmly with discs and locknuts.

Fix a first stopper on sleeve PVC using 3 screws. Add a wire connector on the threaded rod. It will be the low part of the coil and the wire connector will receive the whorl shortened gradually for the tuning of the antenna.

Bore the other stopper for the passage of the wire of the coil and bore a side hole on PVC for the same reason. It is the high part of the coil, its starting point.

The wire will enter by the top through the stopper but will pass by outside for the low connection (that which will be gradually shortened at the time of tuning).

Stretch the wire so that it takes a rectilinear form so that the whorls can join perfectly.

Pass the end of the wire by the hole beforehand bored in PVC tube To arise inside the tube to pass then by the hole of the stopper.

Close and fix this one. Now, the coil is ready to be wound.

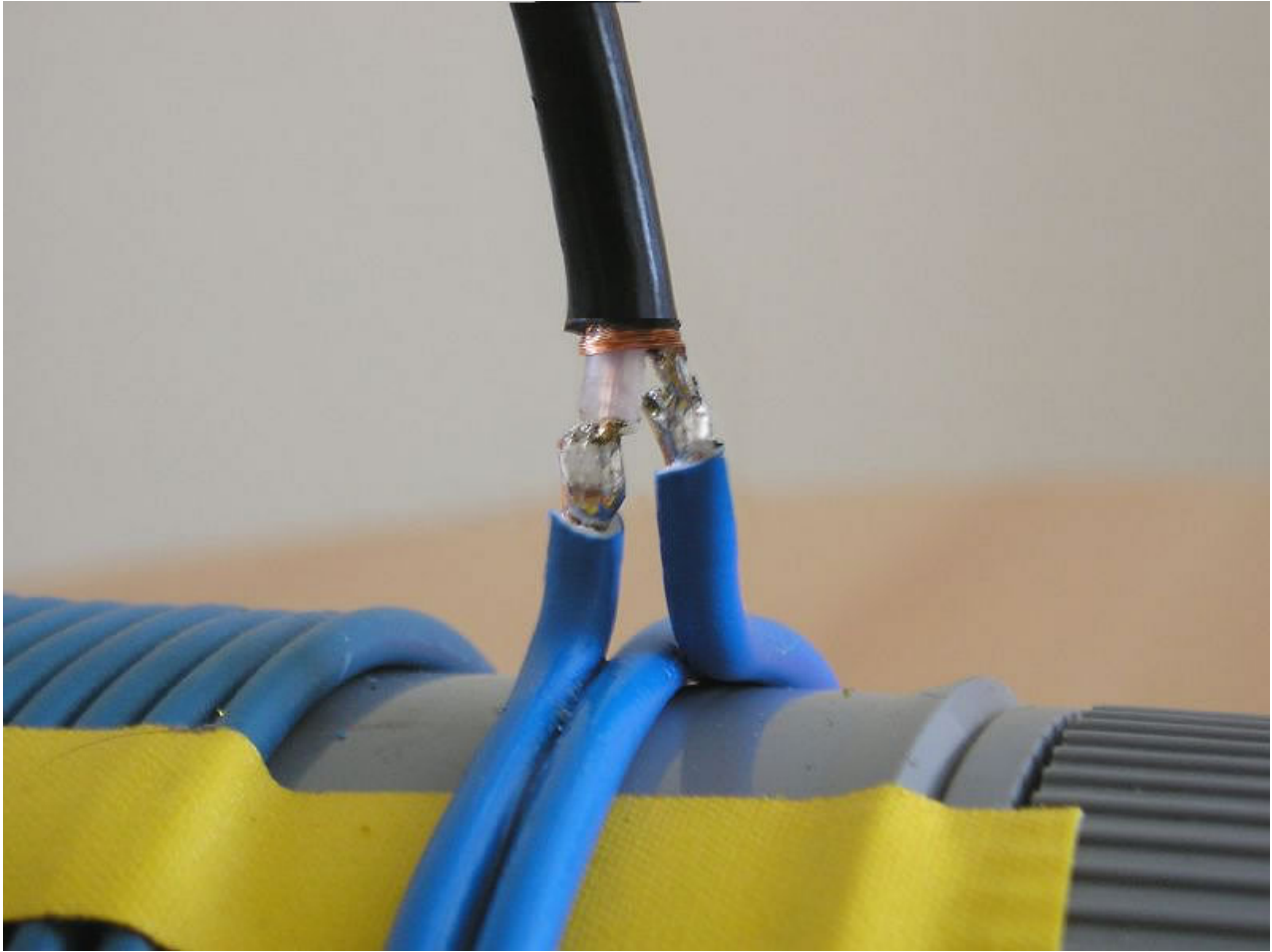
Firmly attach the loose lead of the wire on a support and all while maintaining the wire tended, wind the coil (jointed whorls), with less the 18 whorls (it is to better put of it more

than not enough, even if in principle, the tuning should be found around of 16 whorls).

The end of this coil is welded onto a wire connector fixed beforehand on the lower threaded rod, with more close to tube.

Coupling coil





2 jointed whorls in flex-wire of 2,5mm².

The coil is wound on PVC, under the principal coil, in the same direction and without too much tightening because it will have to be able to slide vertically. Its whorls are maintained together by some points of adhesive cyanolite. Its ends are connected to the portion of coaxial (the bonding strip towards the whorl of bottom and the heart on the whorl top) and this connection isolated with sheath. The other end of coaxial is welded with the SO239 (or BNC).

Assembly of the unit



Set up the coils part on the frame without forgetting to place at the precondition discs and locknuts which will be used for fixing with the plates.

locknuts and discs now adjusted on the threaded rods of the coil so that one has 56cm (22 in.) between the two plates and that the support of coil is centered in height.

The whole of the nuts being firmly screwed, to check conduction enters the two plates using an ohmmeter.

The antenna is ready for tuning.

Adjustments



The use of a bridge of noise or better, of an analyzer such as a MFJ259, makes it possible to have both indication of frequency and impedance and this, without emitting. But a simple Swr-meter is also appropriate, used with a few Watts only as long as the adjustments are not finished.

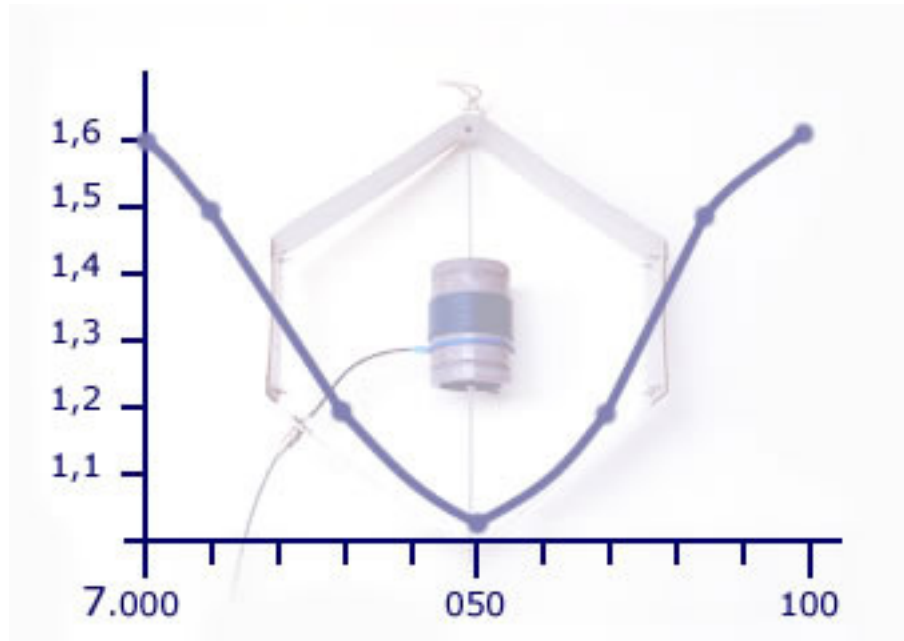
To seek the frequency of desired resonance, it is gradually necessary to cut the length of the coil. With each operation, the lower end must be welded with the wire connector. The coupling coil must gradually distant or be brought closer to the principal coil until obtaining a minimum [SWR](#).

You can note the enormous influence of the immediate environment on the adjustment of the antenna. Moreover, the simple fact of touching the measuring apparatus influences the adjustments.

The solution: to carry out an earthing of the base of the antenna, the lower plate. The adjustments are immediately frank and stable without any influence at the time of the operations of the apparatuses. It is necessary all the same to grant the antenna to the place where it will be used if there are many obstacles in the immediate environment of the antenna.

Measurements





For a fo fixed at 7050 Khz where the SWR is <1.1 PB is 155kHz (at swr : 2.0). The 40m band is covered with 1,6 at 7000 and 1,6 at 7100. No problem to use with 100w.

To compare with an other antenna, i use a VB800 vertical antenna (DXSR - 3 to 30 MHz - SWR <1.5 on all his band-width (it is true)). On 40m, this antenna isn't very fine : about -20dB to a dipole !

The Isotron is 6 to 10dB the higher than the VB800 at European distances. The VB800 being placed on a pylon with 10m of the ground and the Isotron, inside, 5m below the base of the vertical, under the roof of the terrace.