



Vertical 80/160 cw/ssb 5kw



Vertical Antenna 80-160 Height 20 meters

This antenna has the peculiarity to be built in two parts, one in aluminum 10 meters high, and the other in 2.5mm steel wire 10 meters long.

This system allows you to install an 80meters full-size vertical antenna more easily than a classic aluminum-made.

In case you have a tree in your garden or any anchoring spot at ten meters from the ground minimum and a suitable distance, you can install the antenna as inverted L, 10 meters vertical with aluminum and 10 meters horizontal with the steel wire. If the anchoring spot is at a height more than 10 meters the steel wire will be mounted oblique.

The advantages are: a radiator of 20 meters with a large bandwidth on 80 meters and adequate on 160 meters, a more suitable mechanical resistance fatigue compared to a 20-meter-aluminum rod and, if mounted inverted L, a reduced noise factor compared to a vertical antenna.

The antenna is equipped with a CW/SSB vacuum relays switch at 24 Volts.

Power rating 5Kw

Weight 14Kgs.

All bolts and the steel wire are in stainless steel. Tubes diameters are 50-35-30-25-20 mm.

IZO AEG

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Assembly Instructions

Chapter one Assembly

- 1) In **Figure 1 and 2** you can see the RF box and its slot. Insert the bolts in the dedicated holes on the side marked with a red seal and tighten the nuts. It is advisable to use 2 wrenches size 10. One will keep the nut blocked behind the box; the second wrench will be used to tighten the lock nut to the aluminum tube.

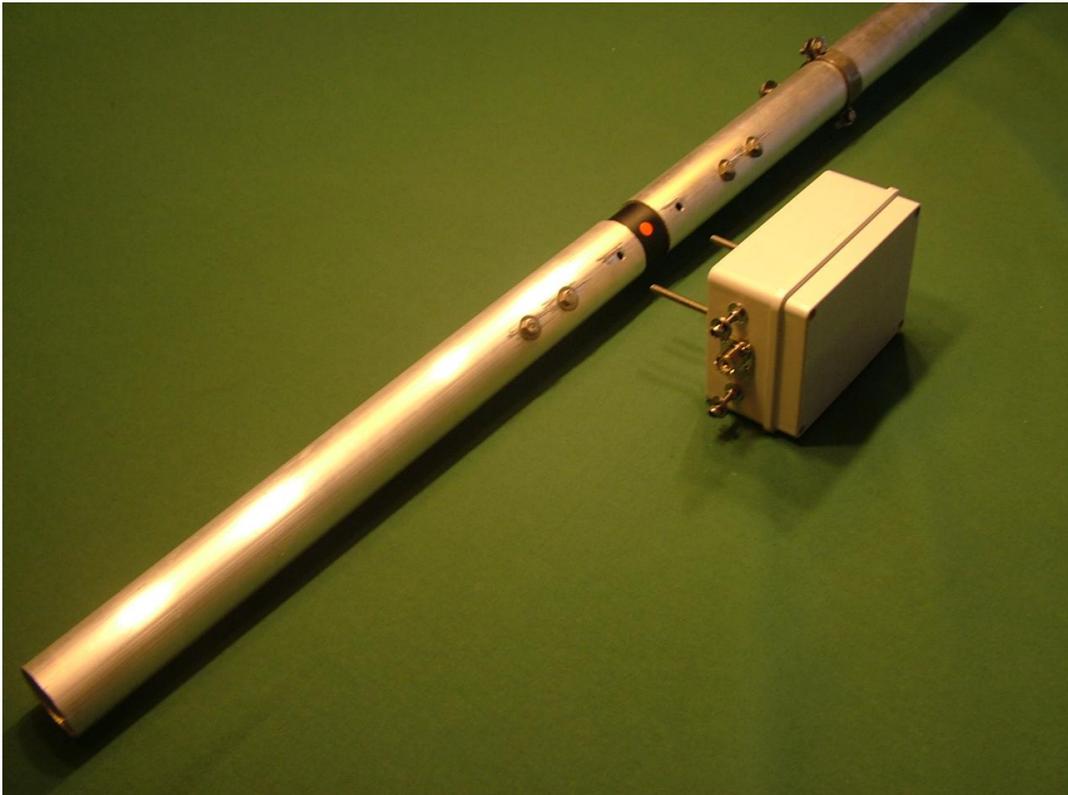


Figure 1

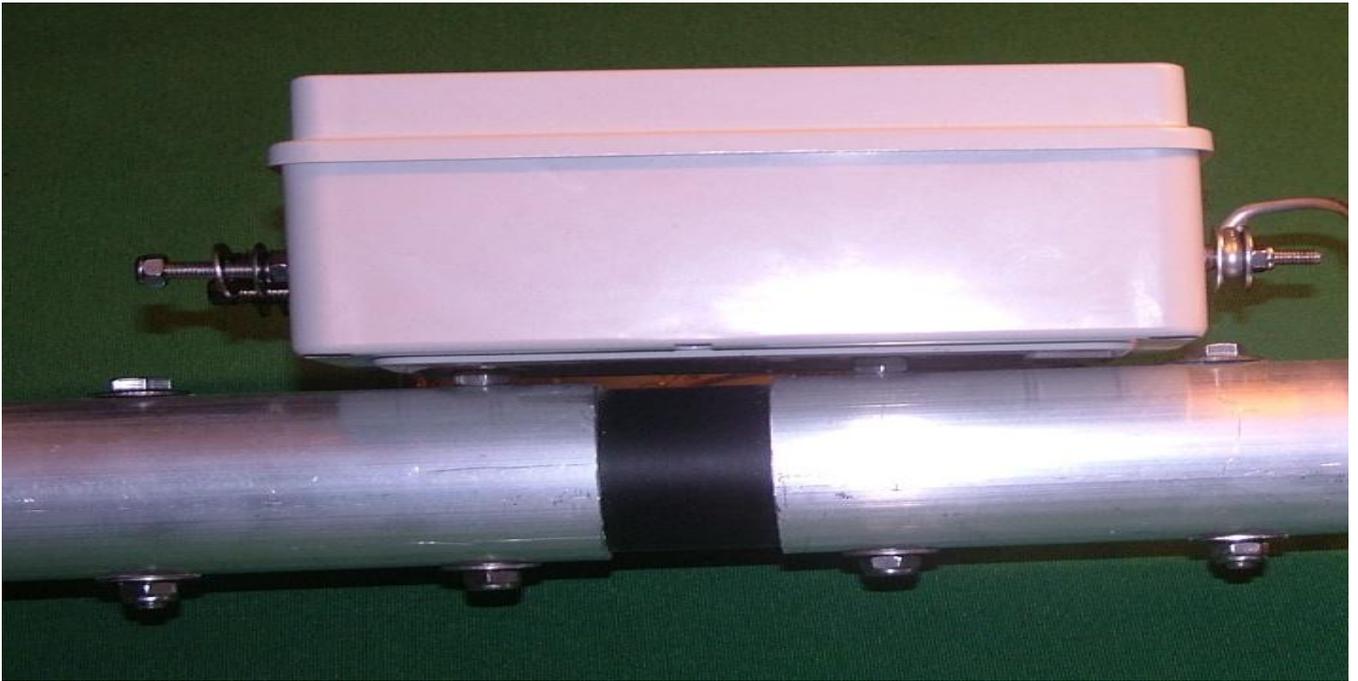
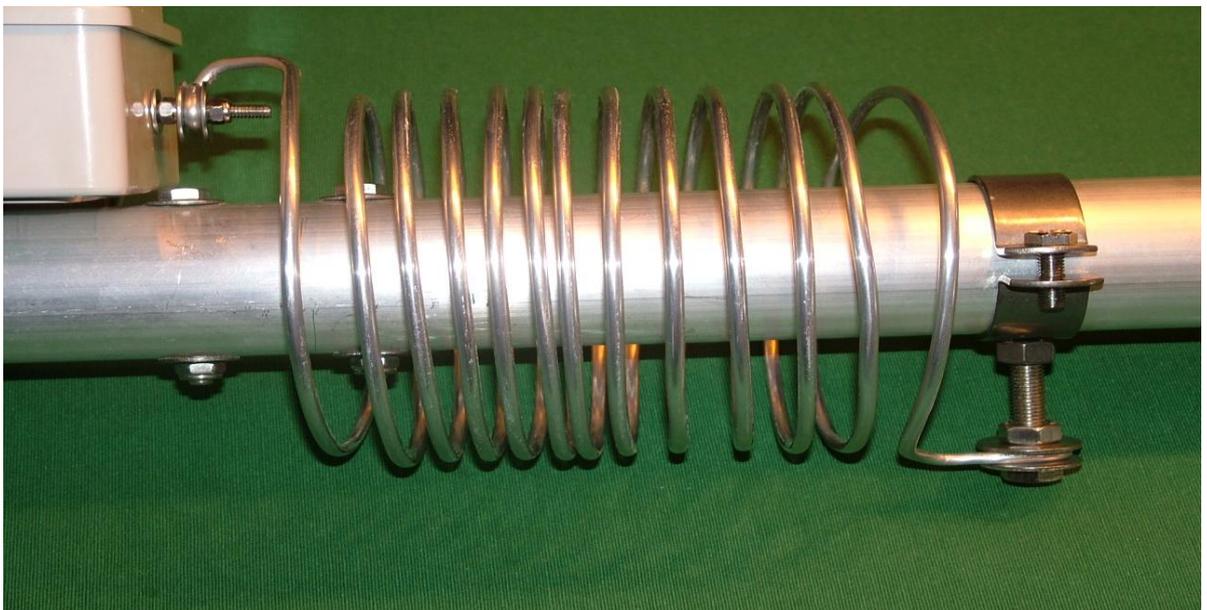


Figure 2

- 2) In figure 3 you can see how the 160 meters coil is joined from the RF box to the stainless steel clamp. The whole antenna assembly is very simple and intuitive. We recommend paying close attention to the aluminum coils assembly. After their insertion in the tube they must be tightened to the anchorage screws. **Be careful that they must be placed as much as possible equidistant from the tube and the turns must not get in contact each other.**

Figure 3



Proceed this way:

Slide the 160 meters coil into the tube. Be alerted to insert it with the small screw eye toward the RF box side. Before the final nut tightening of the coil, **locate the best setting position so to be equidistant to the tube and tighten it. Adjust the coil softly with your hands and ensure that the turns do not get in contact each other. Figure 4**

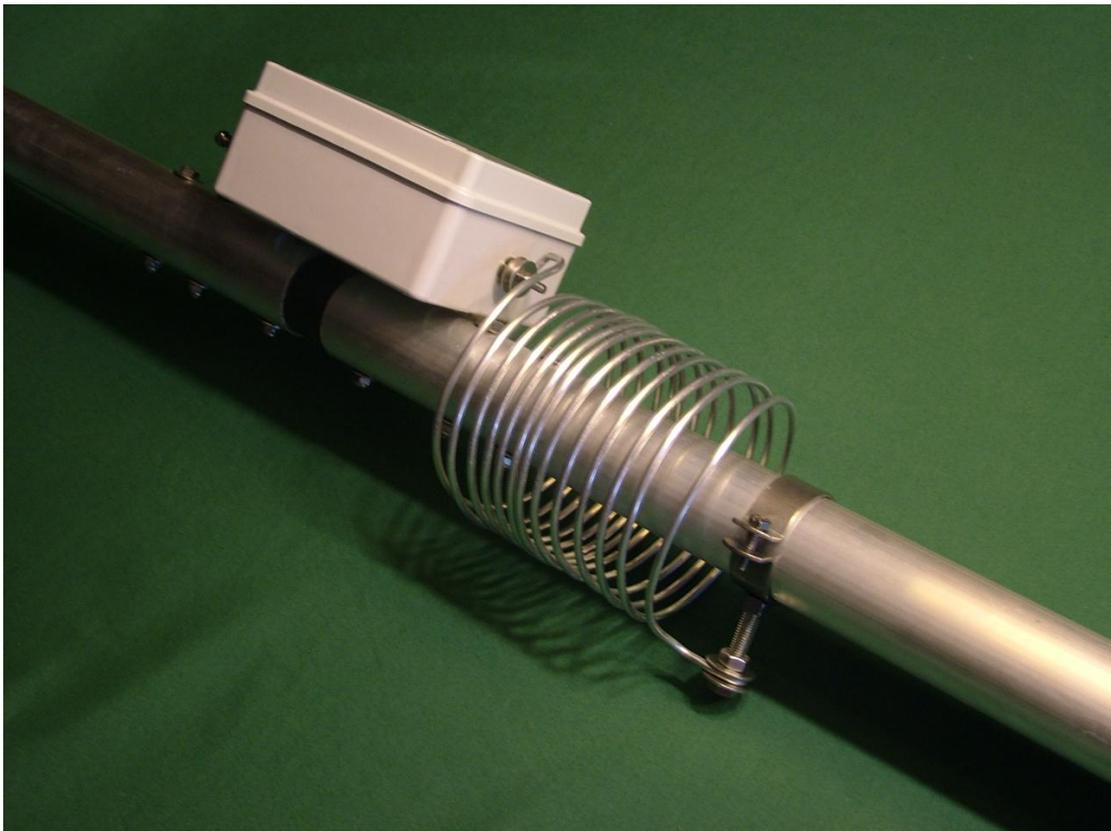


Figure 4

- 3) The third assembly step is to insert the telescopic part of the antenna. To proceed you only have to match the insulator holes to the aluminum rod holes on the side marked with red stickers. **Figure 5**



Figure 5

- 4) Perform the operation you executed for the RF box and the 160 meters coil, to the cw/ssb switch box and the 80 meters coil. Insert the coil into the upper part of the antenna without removing the plastic clamps and without disconnecting it from the switch box. Stop it at the red sticker position and fasten the switch box to the antenna; align it to the RF box. **Figure 6-7**



Figure 6

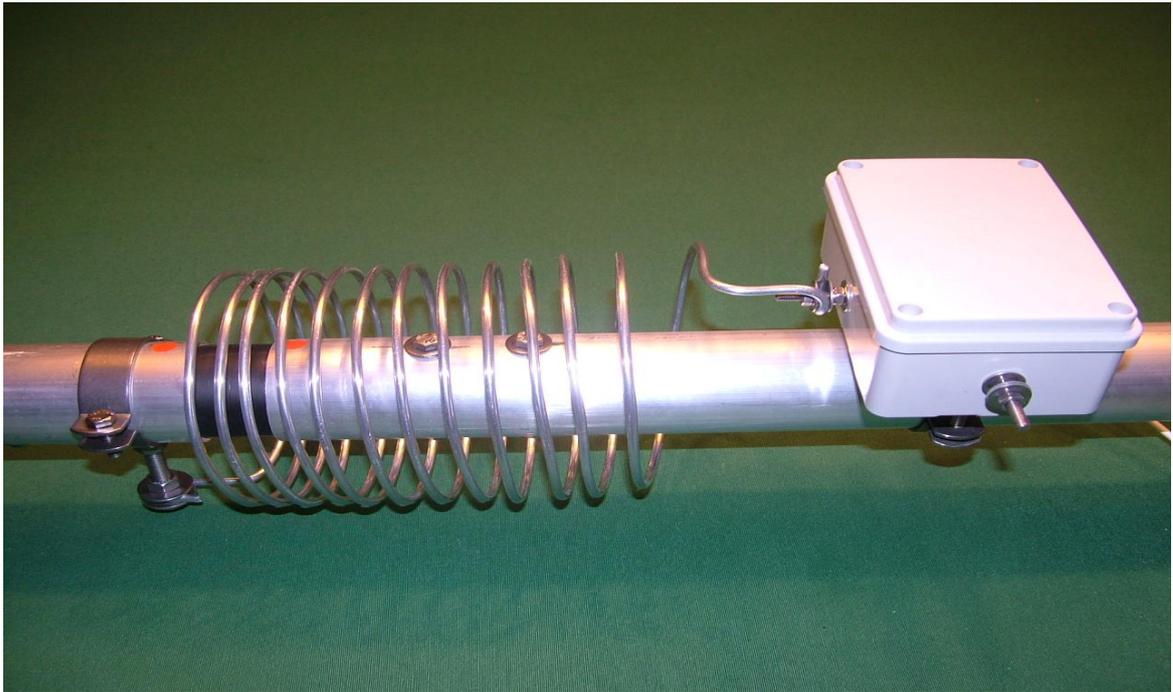


Figure 7

- 5) Last step before erecting the antenna is to anchor the steel wire to the top of the antenna and insert the steel flanges. **Figure 8**



Figure 8

- 6) At this stage we can loosen the clamps that lock the telescopic part of the antenna and lengthen each element to 1,5 meters. Measurement does not

have to be perfectly precise to millimeter. After assembly the aluminum part will be about 10 meters high.

- 7) After untying the steel lead we can raise the antenna. The easiest way to install the antenna in the garden is to tap in a pole in the ground and anchor the steel wire in a suitable frame to have an Inverted L antenna. Two persons are needed to raise it up. This is not due to its weight that amounts to 12 kgs. only, but to the probable oscillations that may occur. **Figure 9**



Figure 9

- 8) Be alerted that either in ground or roof installations the antenna has to be fastened below the RF box. In ground installations the antenna must be close to the ground. See Figure 9.
- 9) Ground plane system. This topic has been extensively covered in several Amateur Radio books. A good ground plane means an optimal performance of your antenna. For ground installation the more radials you place around the feed point of the antenna, the better it is. The radials do not necessarily have to be all $\frac{1}{4}$ wavelength, they can be of any length, but a small number of them are required to be $\frac{1}{4}$ wavelength, as the installation permits. For rooftop installation the radials must be resonant. The radial system must be connected to the antenna by using the last 2 bolts at the bottom of the antenna.

Chapter 2 Antenna adjustment

1. Move the lower coil (for 160meters) up or down the antenna to have the desired frequency resonance.

Example: if the antenna is resonant at 1800 KHz it means that it is long, therefore move the coil upward; vice versa if the antenna is resonant at 1890 KHz it means it is short, therefore move the coil downward. (NOTE: Loosen both bolts on the stainless steel clamp to move the coils. Move the coil upward or downward by keeping the coil equidistant from the tube. Once the desired resonant frequency is found, tighten the bolts for permanent use. The coil moving must be performed in steps of few millimeters at a time.)

Now we can work on the 80 meters coil, the upper one. The antenna must be calibrated in the cw portion of the band. If the switch box has been mounted above the red sticker as shown in Figure 6 and 7, the antenna will need only little adjustment. To achieve this, loosen the screws on the clamp behind the switch box and move the switch box upward or downward. This adjustment is similar to the previous one; if the resonance is at 3500 KHz move the switch box (and the coil as a consequence) upward. If the resonance is at 3600 KHz move the switch box (and the coil as a consequence) downward. The switch box moving must be performed in steps of few centimeters at a time. **WARNING! MOVE THE SWITCH BOX UPWARD OR DOWNWARD BUT DO NOT MOVE THE STEEL CLAMP BELOW THE INSULATOR.** Connect the cw/ssb switch box to the coil. Locate the comb clamp on the coil and connect the aluminum wire supplied to the antenna as shown in **Figure 10**. The adjustment should be almost correct. For fine adjustment proceed as follows: feed the switch box with 24V. Check polarity is not required. Measure the resonance. If the resonance is too high slide the comb clamp upward. If the resonance is too low slide the comb clamp downward.

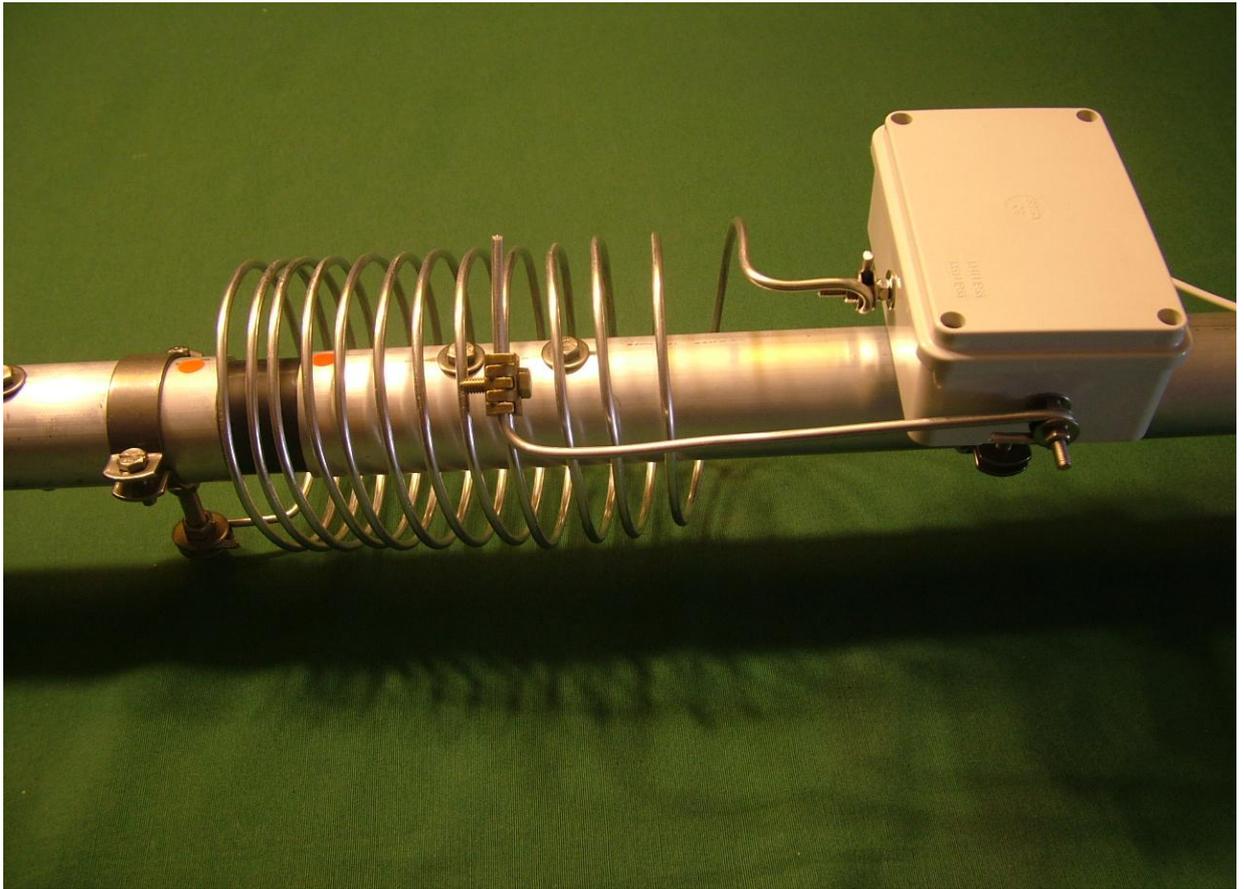


Figure 10

2. For final adjustment a coil is needed to be connected to the 2 bolts aside the RF box antenna connector **Figure 11**. A cable and a plastic tube with a diameter of 40 millimeters are provided. Wind 8 to 14 turns well tightened on the tube. The number of turns changes depending on the ground plane and can be different according to the installation factors involved. Once the correct number of turns is found, fasten the coil to the RF box.

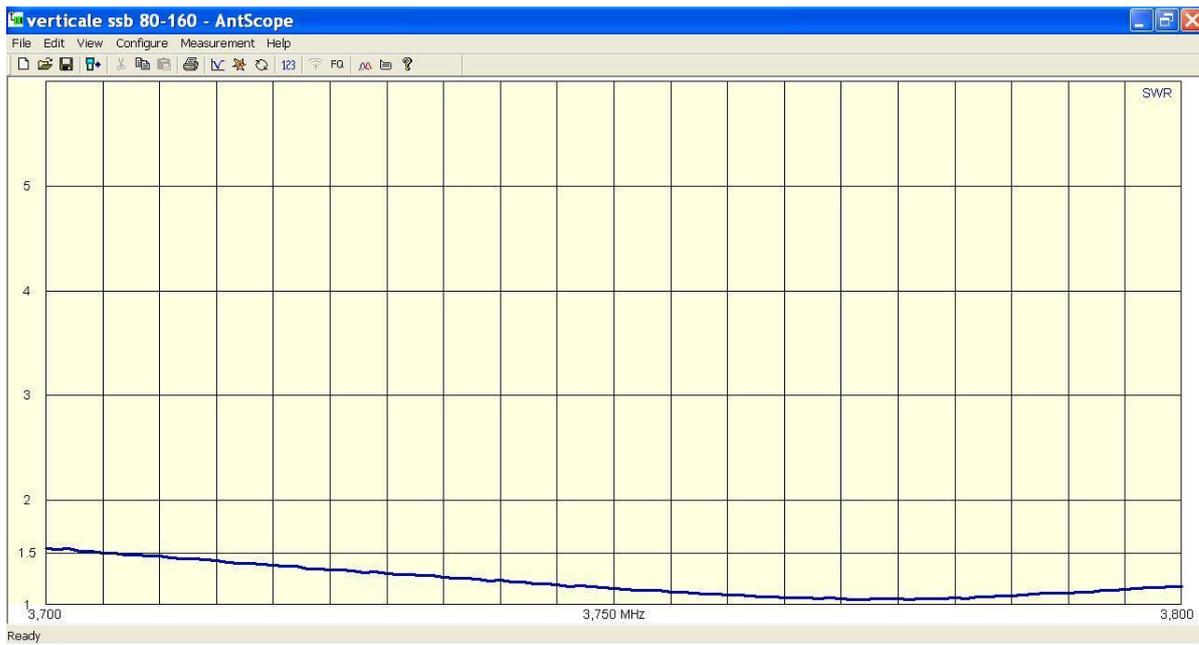
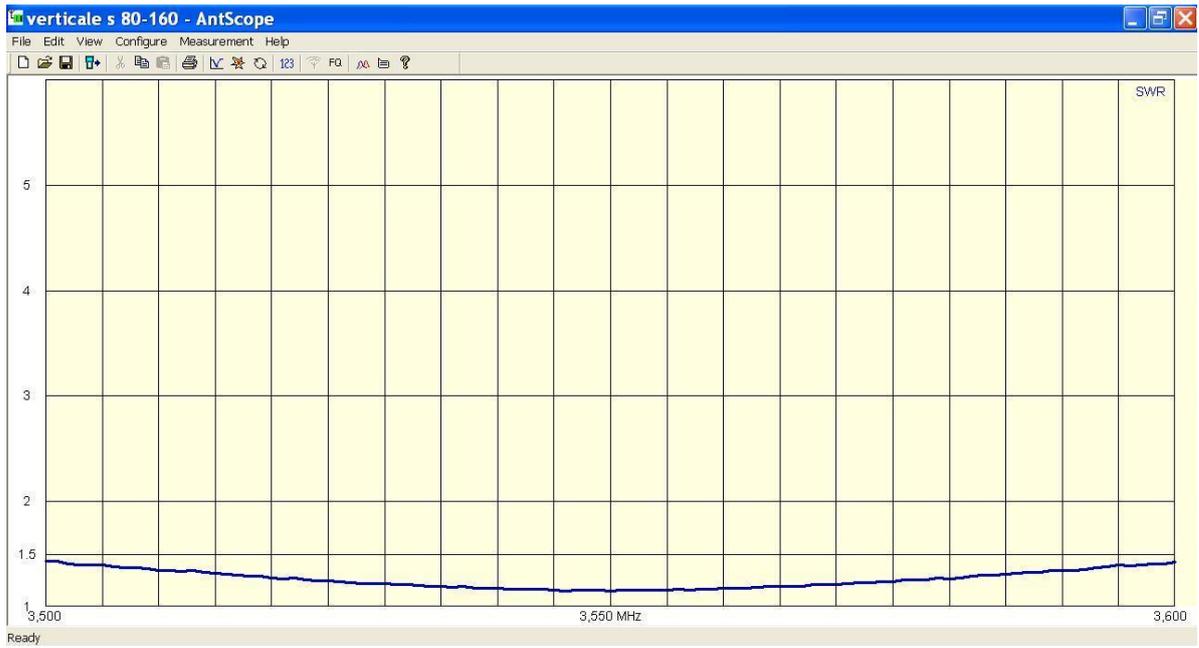
The insertion of this coil may change the resonance on 160 meters and slightly affect the 80 meters. Hence a fine adjustment may be required as described at point 1. The insertion of this coil is very important to reach optimal matching impedance and it short-circuits the antenna. **Therefore it is advisable to insert this coil even if the SWR value is low.**



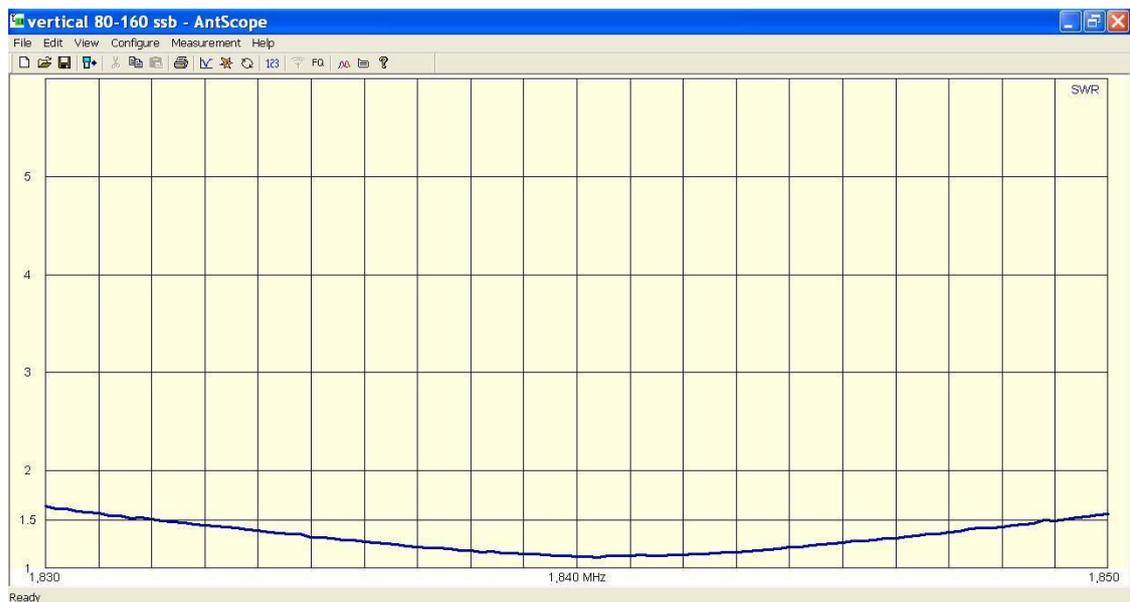
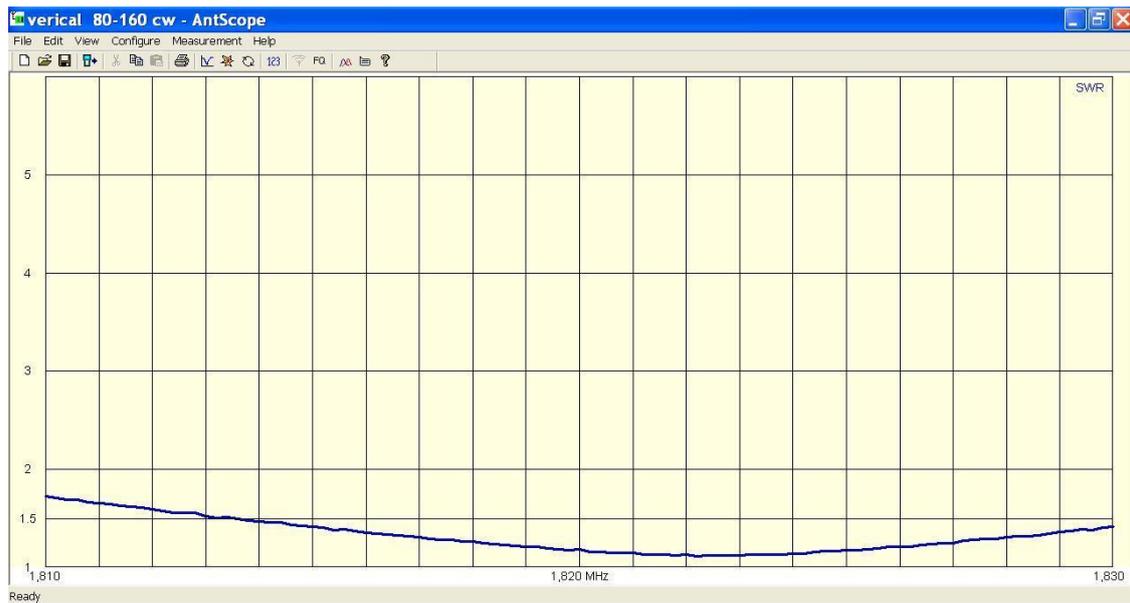
Figure 11



Figure 12



The two charts above show the bandwidth achieved on 80 meters band in the CW and SSB windows. The values refer to a ground assembly.



The two charts above show the bandwidth achieved on 160 meters band in the CW and SSB windows. The values refer to a ground assembly.

In conclusion I remind you that the antenna is always in the position 80 meters CW – 160 meters CW when no fed at 24v. The switching into 80 meters SSB occurs by feeding the vacuum relays switch located in the power supply box. The supply cable provided is “no polarity cable”.

Thank you for choosing us.

Enjoy DXing with AntennaDinamica

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