# 2 m. Band VHF Collinear with 2 Dipoles

This page is the second part of my VHF Collinear antenna project with matching-system for 2 dipoles model (Gain = 5.15 DBi).

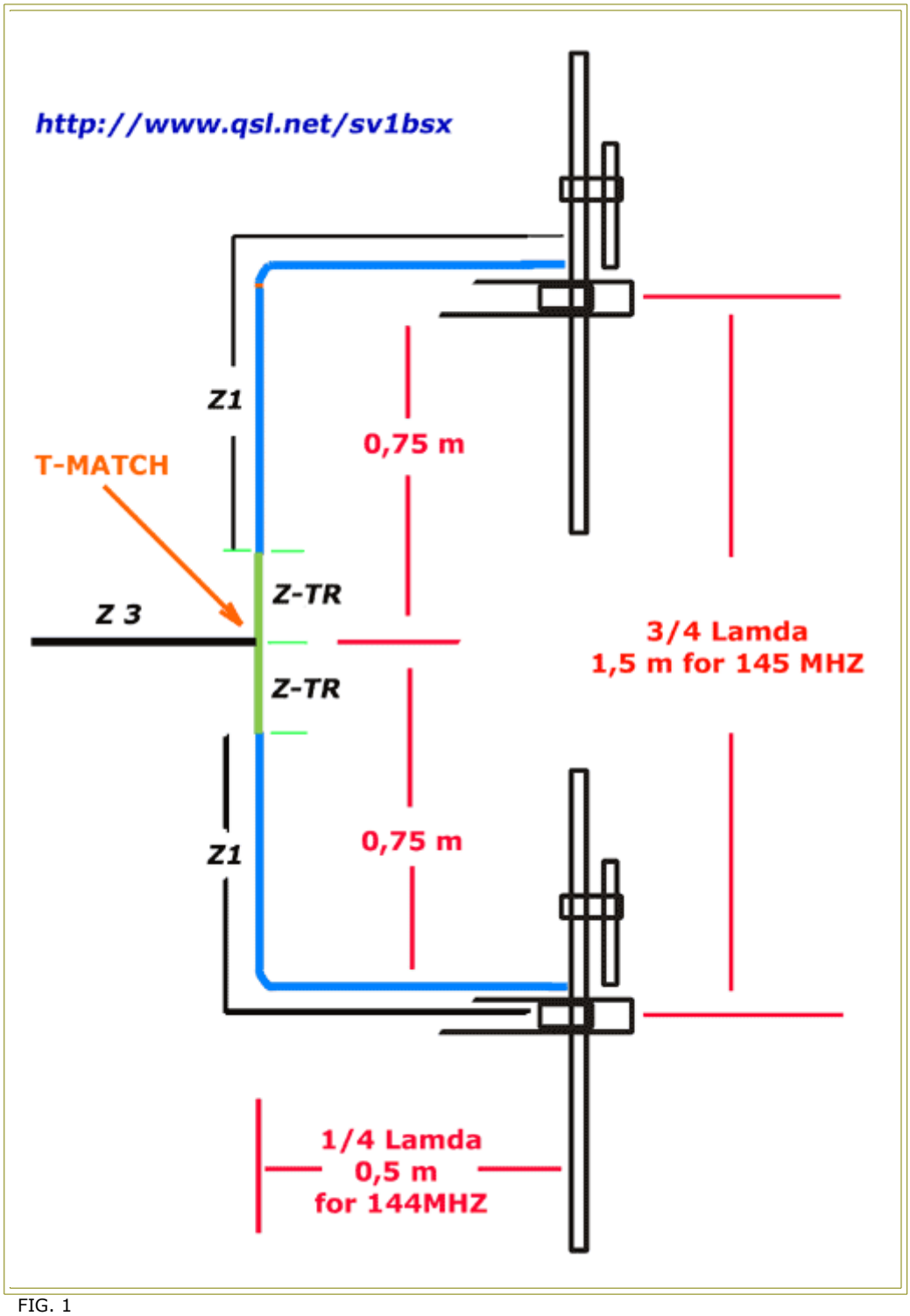


FIG. 1

**Fig. 1** shows the 2 dipoles with details about the coaxial cables. The space between the two dipoles is 1,5 m (0.75 wave length).

**"Z1"**(with BLUE colour) is the "RG58" section which I've described in the **"Gamma match Dipole"** page. On this collinear the length of Z1 is 1.36 m, 1 Lamda "electrical" (Lamda/2 x 2), because the Lamda/2 is not enough from Gamma match up to "Z-TR" (L/2 is too short).

The **"Z-TR"** (GREEN colour) section its a piece of 75 Ohms coaxial cable (RG59) which acts as "Z" transformer. Further details of **"Z-TR"** shows the **FIG.2**

**"Z-TR"** acts by transforming the 50 Ohms impedance (from each dipole) to 100 and then we have again 50 Ohms on the "T" match connection point (2 impedances of 100 Ohms in parallel = 50 Ohms)

The "Z-TR" section is an "electrical quarter wave" (Lamda/4) **x** velocity factor of 75 Ohms RG59 (= 0.66). The impedance of Z-TR is given by the formula:

**Z-TR = SQUARERoot Z1*Z2**

where Z1 is the antenna impedance(50 Ohm) and Z2 the request impedance (100 Ohm).
The "quarter-wave" length on 145.000 MHZ its 0.517 m. So, the "electrical" Lamda/4 is:

**0.517 x 0.66 = 0.341 m**

That means a length of about 34.1 cm of RG59 coaxial cable.


**FIG. 2**

**FIG.2** above shows the construction details between RG58 and RG59 coaxial cables. The "A" point must be connected with the 2nd "Z-TR" from the other Dipole and both with the RG213 (cathode coaxial to transceiver). This way, we have made a **"T-match"** for the 2 dipoles.

**FIG.3** shows the contruction of "T-Match".

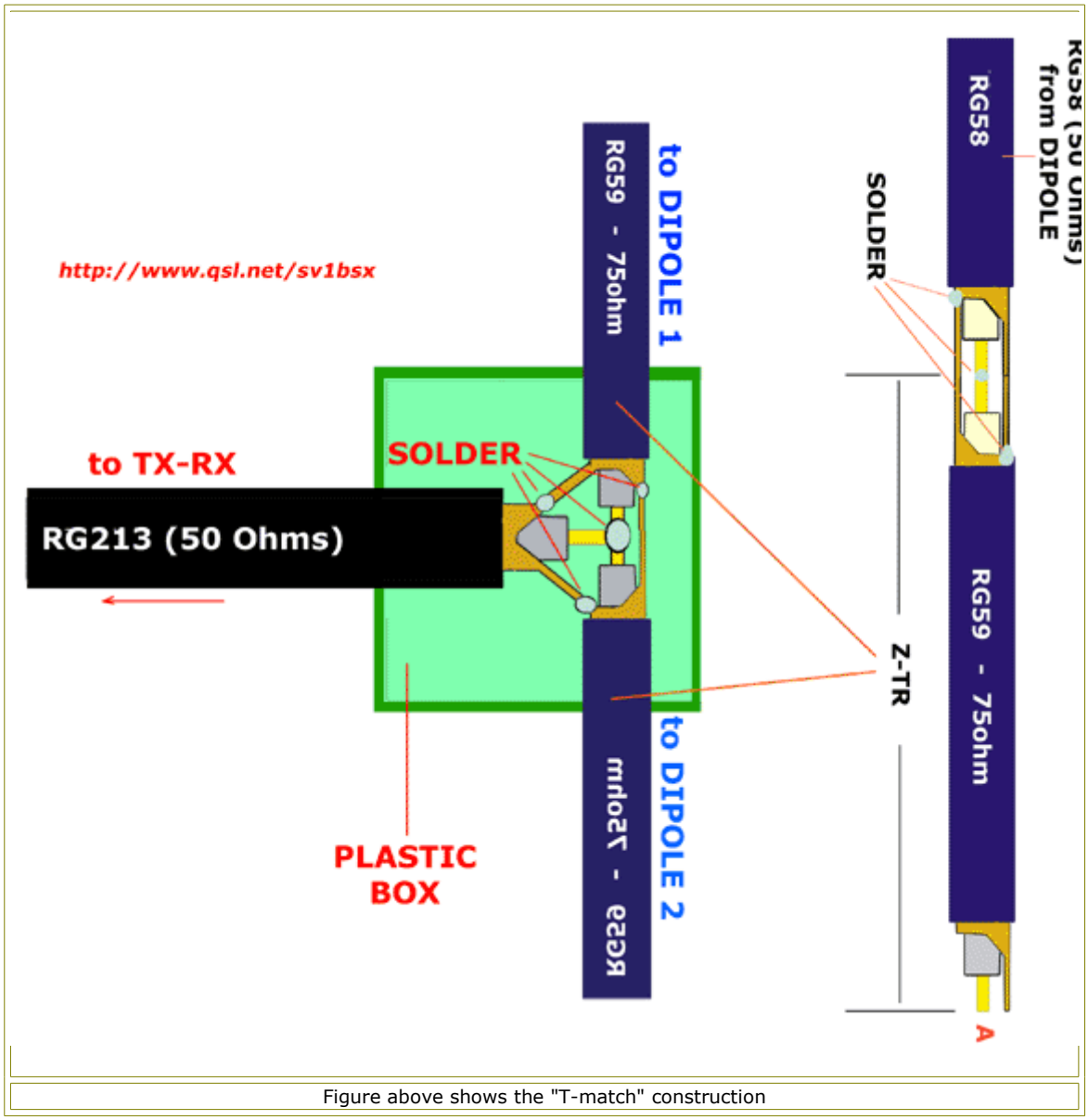


Figure above shows the "T-match" construction

**FIG. 3**After the dipoles and coaxial cables placement into the mast, its time for the final tuning. Each dipole is pre-tuned (see the previous page about dipole). With the mast down (in parallel to the roof) and the two dipoles up (looking to the sky), the SWR ratio it must be lower of 1:2 SWR ratio. By moving the two "slide-brackets" simultaneously (for example, that means 5 mm on the upper dipole and also 5mm on the lower dipole), we looking for a low SWR ratio, near to 1:1.
If that is possible, the collinnear its OK. If no, check again carefully the dipoles, the cables etc... something is going wrong.

In case which the antenna has a good SWR we are ready to settle the mast on the final vertical position. Now its time for the final tuning. Keep in mind, the lower dipole it must be 2 m. (1 Lamda) or more above the roof or ground but for higher perfomances 2 or 3 "Lamda" its recommended .

My antenna has SWR 1:1 on 145 MHZ and 1:1,2 on 144 & 146 MHZ (the final tuning was very easy). After the final tuning don't forget to secure the two screws on both slide-brackets with a screw-driver. A plastic-tape is nessecary on the connections betweens coaxial cables for WX protection... additionally a plastic-spray on the slide-brackets, connections etc. helps for an operation without problems for many years.

That's all folks... Have Fun ! **Makis SV1BSX**