

# AND YET IT WORKS OR BETTER THE D2T

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## A VERY STRANGE THING WHICH SHOULD BE AN ANTENNA.

What deeply troubles most radio-amateurs? Certainly the lack of space so they cannot assemble their own antennas in the most suitable way.

I don't succeed in explaining to you how nervous I feel whenever I glimpse at the manuals of some apparatus and read the " antenna set-up " passage. Well, we are suggested the classical box wherefrom a " Levy " starts or the classical dipole attached to the even more classical " tree " of high trunk ( probably an oak ) strategically placed at some fifty meters from the building on which a megatower supporting four " full size " monobands stands out proudly as well as an impressive variety of V/U/SHF antennas. It is an evident disinformation mark from the printer of such manuals, he sees OM as a happy land-owner of Texan origin.

But for us Italians who are very fond of antennas in general, the crude reality is that we have to reckon up a more and more exiguous space specially if it concerns me, the under signed, who lives in an urban centre.

About one year ago, while I was going to decide to take the CW examination in order to achieve the " normal " licence after almost thirty years of V/U/SHF when I had tested everything testable, I found myself to solve the problem of what antenna to assemble for HF on the little space at my disposal. I predict that my " shelter " is placed on the basement, that my house is 13 meters high from the country ground level and on the roof there is ( fortunately ) a 12 x 6-meter terrace at my disposal.

As I had already assembled other antennas on its four sides, necessarily I could not assemble directives as well as dipoles and big-dimension " inverted V " ones, considering my interest in the HF low part.

Another " adversion " of mine consisted in the so-called " trapped " antennas I avoid since they seem to be a plague considering their inborn band limitation and sensibility to atmospheric agents. Another problem was to find an " antenna " compatible with the military apparatus wch I occupy myself with, and the new " civil " RTX in consideration that the latter are on continuous tuning in almost all cases. According to my habit, I didn't rely on the " chatters " and I started by myself ( and at my own expenses ) a series of valuation tests in order to see " on the field " which was the best antenna for me. After redefecting " a priori " the directional antennas , dipoles and long-wire ones, I started the test of several verticals of domestic and foreign production. The results were not " enrapturing " since, in order to obtain a minimum output, I used some heights going from a minimum of six to a maximum of nine meters. They needed some wind guy-ropes ( really I hate them as well as the traps ) which are trapped in most cases with band widths specially of 80 and 160 meters. This is ridiculous just to say. For a minimum output they are to be used with an " enormous number " of radials ( see wires spread on the roof ) like artificial earth. A non-last handicap is that the vertical polarization is not certainly the maximum for the town-dweller, considering that the natural propension of the vertical ones to radio-impulsive disturbs.

At that time the only possible solution seemed to be the assembling of two " delta loops " magnetic ones. I had the way of testing and appreciating them but they had two defects, one depending on my financial condition with the consequence that, in order to cover 1.5 to 30 MHz, I should have bought at least two antennas with an expense of at least 5.000.000 liras; the other was the inconvenience to tune again the antenna at every minimum frequency movement.



Then I was almost decided for a wide waste of money when I saw the advertising about a very strange antenna named " D2T " .

It had been made and promoted by a Tuscan company of old and tried reliability. I read its characteristics which are as follows : 1.5 to 200 MHz RTX frequency, a KW PeP, no tuner, no need to assemble it at long distances from the roof.

Though I was a little doubtful about the veracity of what affirmed, I asked myself if the manufacturer had not discovered " Columbus's well-known egg " .

Some doubt was corroding me and, as I am accustomed to try by myself all that interests me, I thought it advisable this novelty too. Then I ordered the " D2T " antenna by phone and after a few days a well-packed parcel reached my destination by courier. First pleasant surprise: after unpacking its components I realized their high quality. All screws are of stainless steel, the fiberglass of the radiators is " UV-proof " , a 40 mm diameter " boom " of " AT6 " aluminium is considered one of the best in the world, very strong hot-galvanized cross-joints and a very clear assembling manual. Early in the first morning of fine weather I brought everything to the roof and with no help I started its assembling by carefully conforming to the due use instructions.

I allow myself to open a parenthesis to explain a very important question. This antenna, as assured by the manufacturer doesn't derive from any other antenna existing on the market but it is the result of a continuous study for many years. Consequently he who finds some resemblances will consider them merely casual.

### Assembling.

I predict that the assembling of the D2T antenna requires on the spot the employment of a soft-solder device to solder the junctions of the copper cables among them. As you can see from the photos the fiberglass arms of the two radiators are 6 meters long with 20 cm side verticals forming two low " loops " 2 meters far from each other. The antenna has a much limited turning radius ( about 3 meters ) and I positioned it with a CDE rotor on a 3-meter mast. Furthermore, as you can see from the photo, on the mast I assembled a directive fit for 1200 MHz ( very probably when you read this review, the support mast will have lengthened and, besides the SHF directive, will also lodge a twenty-element one for 430 MHz. In conclusion I put to ground the 50 mm-diameter light alloy pole of the D2T and, on the other side, all my

antennas. With respect to the soldering to be used on the roof, I would advise you a gas type. As you can see from the photos, once the two 6-meter fiberglass radiators and the four 20 cm vertical supports have been assembled, we shall have to connect the two loops previously positioned on the boom, that is:

- a) one with the box containing the 50 ohm impedance transformer at the entrance. I consider it as the antenna "heart" but unfortunately it cannot be opened because of its being "monolithic" and "sealed" by the manufacturer, and of its coaxial SO 239-type connector which shows a steady impedance of about 50 ohms at the RTX.
- b) The other with a big resistance (it acts as load and symmetrizer) of about 600 ohms which closes the circuit in the same way as a small rhombic (unique and vague similarity to another antenna). The two dipoles are fed on counter-phase and are phase-angled of 180 degrees between them.

In a couple of hours I had assembled the D2T antenna completely.

### Results.

From 10 MHz upwards we noted a more and more accentuated directivity, very likely because it was reaching more and more the resonance point.

The irradiation is omnidirectional as regards the 160-80-40-meter bands. On the two most "critical" 160-80-meter bands I and my I4CQO friend who helped me, we noted we had less difficulty in executing long-distance connections than in a medium-short one. The reason is due to this antenna showing a very low irradiation angle.

On 160m the farthest connection from Parma was Norway whereas on 80m we connected practically all Europe with never lower than "9 +".

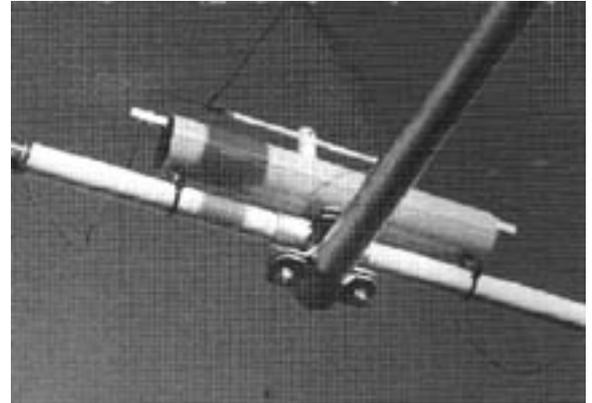
On 40m we reached almost all Latin America. On 20m and 18 MHz with good propagation we succeeded in achieving nice connections with the US Pacific coast.

During the propagation in this summer, on 50 MHz the output of the D2T convinced me to disassemble the 4-element one I had used for this frequency.

As to 144 MHz I executed some comparative tests with a 5-element good-brand antenna of my own. Tranquilly I can assert that, thanks to its daisy lobe, the D2T gets out of the comparison with dignity.

### Modifications.

The manufacturer recommends not to tighten much the 10 mm screws of the cross-joints on both the boom and mast in order not to squash the aluminium tube. Furthermore he advises to check them at least once a year and of course, if necessarily, to tighten them again. As I, the undersigned, am very lazy and dislike making things several times (I allow myself to suggest the following modification to the manufacturer), I inserted three 35.5mm-diameter aluminium rods 5 cm long at the centre and at the two sides of the boom; I drilled and fixed them with 6 mm hexagonal-head screws and I made a 10 mm hole in correspondence with the cross-joints so as to obtain an exceptional mechanic stiffness with the possibility of tightening the same cross-joints definitively, with no risk of squashing.



As to the fixing of the rotator to the mast I made a 10 mm threaded hole on the support cross-joints with a screw which in its turn goes in a hole corresponding with the mast in order to avoid undesired twisting moments.

For information, the D2T had its baptism of fire in July 1998 when Parma was hit by a very violent tornado which devastated the territory where I live, but among very few surviving antennas, mine was standing out undamaged whereas I had already imagined it destroyed in a state of deep depression.

Another modification executed by me concerns the coaxial cable length. The manufacturer suggests a length of about 60 meters, very probably to keep low the SWR because of the attenuation deriving from the cable length. The RG 213-type cable or the classic RG 8 have an attenuation of about 2.1 db at 30 MHz and 3.1 db at 100 MHz on 60 meters. In my opinion this is decidedly a little too much. However, the texts with this length evidenced a SWR never higher than 1.1-1.2 on the whole range from 1.5 to 200 MHz. I wanted also to test with my 20-meters of RG 213 and, by using a "Bird" wattmeter, I could notice the following values of SWR:

1.8 MHz = 1.3 , 3.6 MHz = 1.5 , 7.050 MHz = 1.5 , 10 MHz = 1.6 , 14 MHz = 1.7 , 18 MHz = 1.8 , 21 MHz = 1.9 , 29 MHz = 1.8. On 50 and 145 MHz the SWR remain on 1.5 and even less. After all it is values very acceptable for a "non-resonant" antenna. Then if we want to be perfectionists, as I did we can insert a tuner to remove the residual of SWR to reach the 1:1 report.

For information, the system used for the tests were a military SEG 100-type RTX, a 100 W TR7-type Drake RTX and a RTX FT 736 Yaesu for V/U/SHF.

### Final Considerations.

The D2T antenna operates properly and in accordance with the manufacturer's assertions. For him who is not so fanatic of "DX" as me, it represents a very good "COMPROMISE" which allows me to space in all bands at disposal. The reception is one of the "TOP" points of the D2T antenna and consequently I would suggest you to try in order to believe. Of course, sometimes and in some situations, we need to be satisfied. In compensation I succeeded in cutting down a certain number of antennas and coaxial cables. Another nice compromise is the report between quality and price; at present it seems to be adequate.

Of course if the inveterate amateur of "DeXer" claims monoband services from the D2T antenna, I cannot but advise him not to buy it. Anyway, don't forget that the D2T is and remains a very nice compromise solution, that is always and only a compromise.

A last thing before I greet you: I would like to make clear, besides any reasonable doubt, that with these lines I don't intend absolutely to give an advertising message to both the manufacturer and the dealers. Really I have just nothing to gain from this circumstance but the satisfaction in having acquainted so many other Oms with my experience, they will certainly draw their own conclusions from my words.