

A “Flimsy” W3EDP Portable Antenna (“la Manquita”)

Posted on May 22, 2016 by Jose VA3PCJ

The W3EDP antenna is a favourite multi-band antenna among QRPers, and leading the pack is none other than Bob VA3QV (<https://va3qv.wordpress.com/tag/w3edp-antenna/>)...

I have been staying away from the W3EDP antenna because I strongly dislike the feel of most twin-lead and ladder lines transmission lines (*i.e.*, too rigid for my way of belaying wire antennas as kite-string on a little peg and keeping them inside a pocket...). However, I was lucky to find inside a box in the shack an old piece of TV twin-lead flimsy and long enough for home-brewing a flimsy version of the W3EDP. All wire connections were soldered and covered with shrink tubing and the junction between the twin-lead and the thin single wire was reinforced with a sandwich of hot glue between two plastic collar stays wrapped on electric tape.

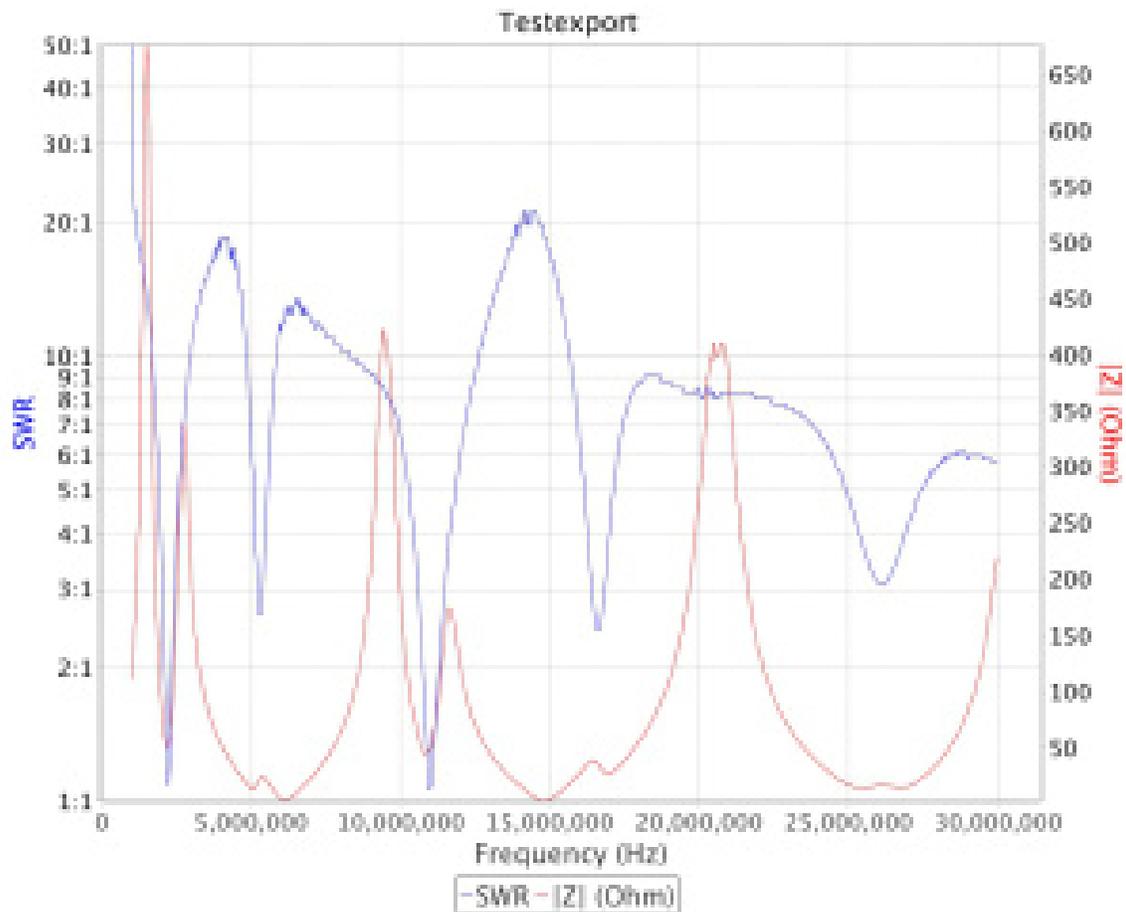
The W3EDP is a simple antenna: it comprises a 17 Ft. stretch of twin lead with one of its wires connected to a 68 Ft. long wire for a total physical length of 85 Ft. It can be viewed as an 85 Ft. end-fed long wire with a 17 Ft. counterpoise or an amputated G5RV with a 1/2 length of its ladder portion transferred to the radiating wire: (what in the G5RV is 34 Ft of parallel feeder and 51 Ft of radiating wire arm, in the W3EDP becomes 17 Ft of parallel line and 68 Ft of single wire...). It requires a 4:1 balun or unun (to further reduce the impedance of the parallel line) and a tuner.

The connection between the G5RV and the W3EDP is further exemplified by the fact that in Spanish-speaking countries the W3EDP is known as “*la manquita*” (*i.e.*, the “little one-arm” antenna).

Whichever way one looks at it, the radiating wire is a 1/2 HWL (Half Wave-Length) wire for 80m, 1 HWL for 40 m, 2 HWL for 20m and 4 HWL for 10m. Interestingly, it is also close to 1.5 HWL for 30m, 2.5 HWL for 17m, 3 HWL for 15m and 3.5 HWL for 12m. The addition of the 17 Ft twin-lead adds 34 Ft to the antenna which can therefore also be viewed as an off-centered fed wire antenna 102 Ft long – *i.e.* the same length as the radiating portion of a G5RV). Note also that in 40 meters its physical length (85 Ft) is a 5/8 WL with the parallel feeder being 1/4 WL. The piece of twin-lead transmission line with its relative high impedance helps deal with the higher impedance at the long wire to twin-lead junction point for frequencies in which the single wire measures close to a 1/2 WL multiple. In 10m the impedance will be higher at feed point (85 Ft is close to a 5 HWL) thus the need for a good tuner (or a series capacitor, as indicated by Ian G3YWK in his outstanding book on “Practical Antennas” – RSGB, Norwich, UK, 2005).

Another “urban legend” about the W3EDP is that it can be morphed into many different arrangements without affecting its radiating power. Whether this is true or not, it should be left to each and every user to decide... But some of the main advantages, particularly for portable operation, are the possibility of deploying it as a single wire, using trees for its support, without the need for poles or of counterpoise wires on the ground

Here is the mini-VNA analysis (SWR and Z vs. frequency at 1-30 MHz) of the W3EDP being deployed horizontally at 7-8 Ft from the ground, connected to the mini-VNA via the LDG 4:1 unun and a few feet of RG-58 coax. It clearly shows how the impedance peaks at frequencies close to multiples of 1/2 WL while also remaining below 400 Ohms throughout most of the HF range and with the SWR remaining mostly below 10:1:



In such setup the internal ATU of the Elecraft KX3 had no problems in readily tuning this antenna to SWR values of 1:1 in every HF band. Only improvement I can think of would be to use the Elecraft T1 remote tuner right after the 4:1 balun and by-pass altogether the internal ATU of the KX3.

Here are the first three QSO made with the Flimsy W3EDP:

OZ4UN, 18076.0 KHz, CW, Tx: 579, Rx: 559
 ZA/S56X, 14025.0 KHz, CW, Tx: 599, Rx: 599
 VA3DV, 3755.0 KHz, SSB, 539, Rx: 439 (400 Km away)

<https://thewakesileave.wordpress.com/2016/05/22/a-flimsy-w3edp-portable-antenna-la-manquita/>