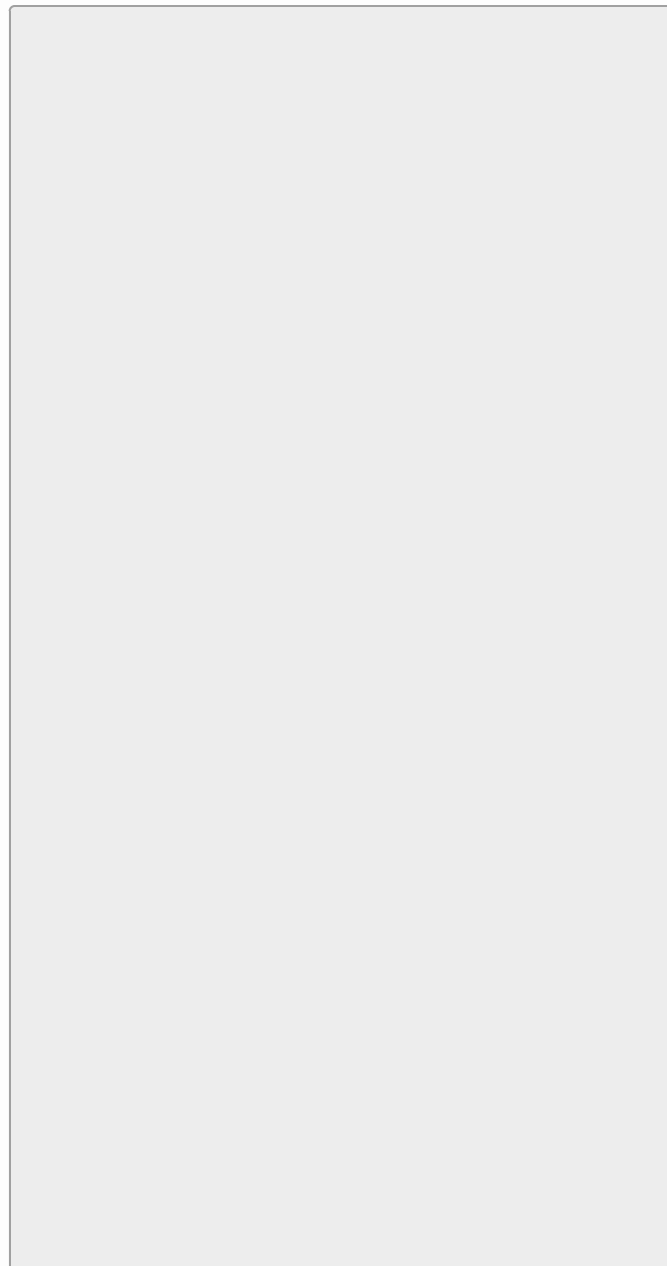


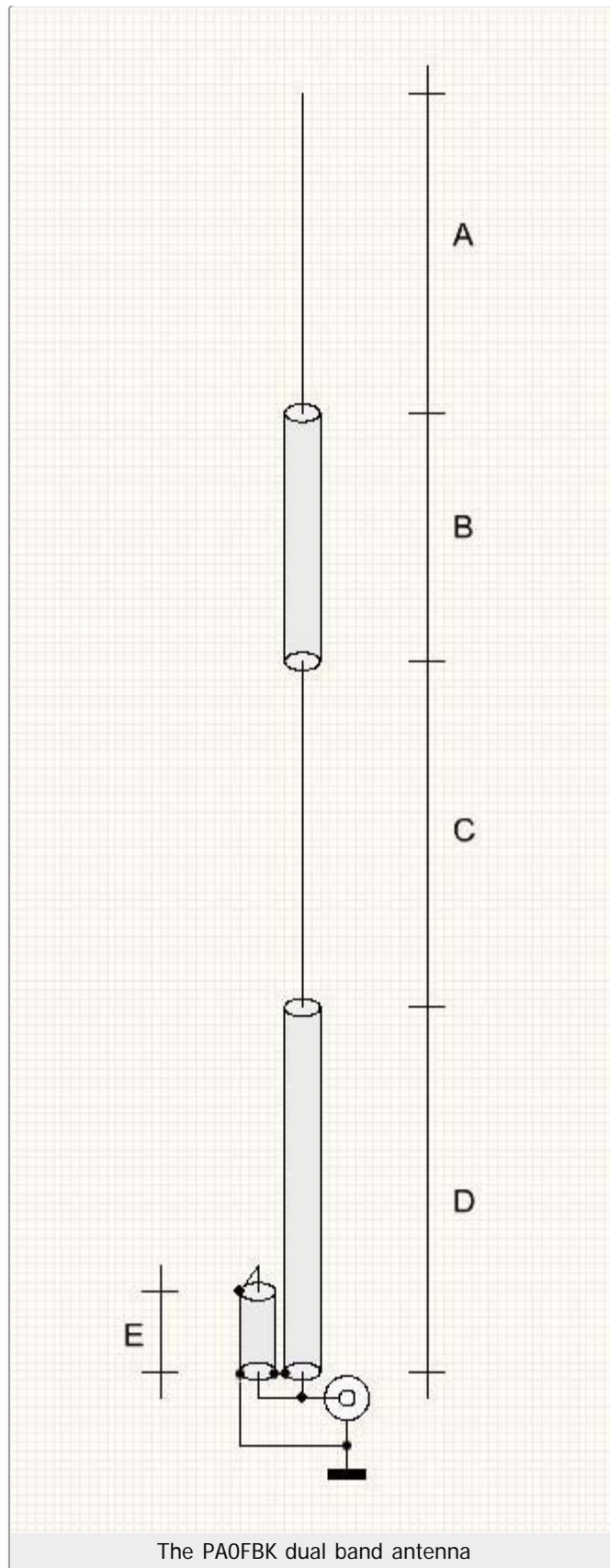
# 2m and 70cm Coaxial Dualband Antenna according to PA0FBK

A cheap and easy to build antenna made of coax cable

*Frank Bremer (PA0FBK) has [published a guide](#) that describes an antenna for 2m and 70cm, which is built from only one piece of coax cable. In principle, it is a variant of a J-pole antenna, providing a good match to 50Ω on both bands.*

The following picture illustrates the setup of the antenna. Two parts of the shielding have to be removed without connecting them to the center conductor. Additionally a small inductor, i.e. a small piece of coax cable, shortened on top, has to be connected in parallel with the feed point.





When using RG-58 coax cable the following measures have to be used:

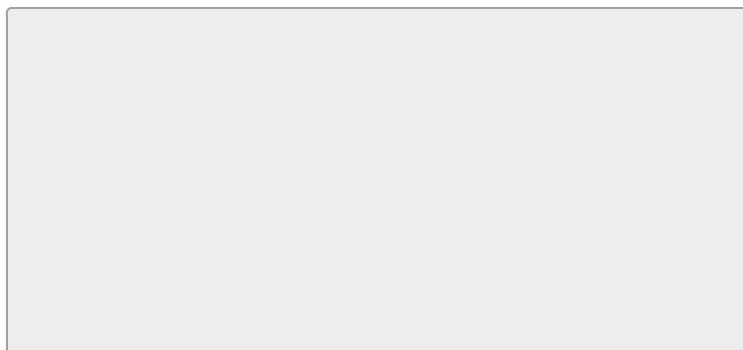
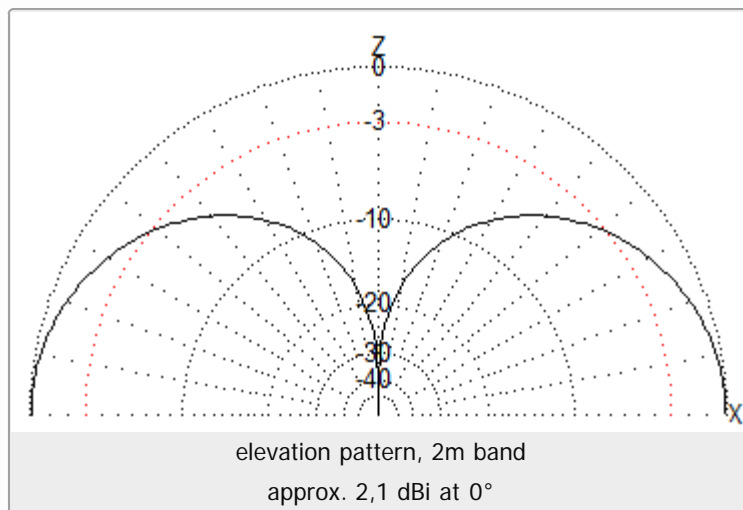
No.	Length in mm

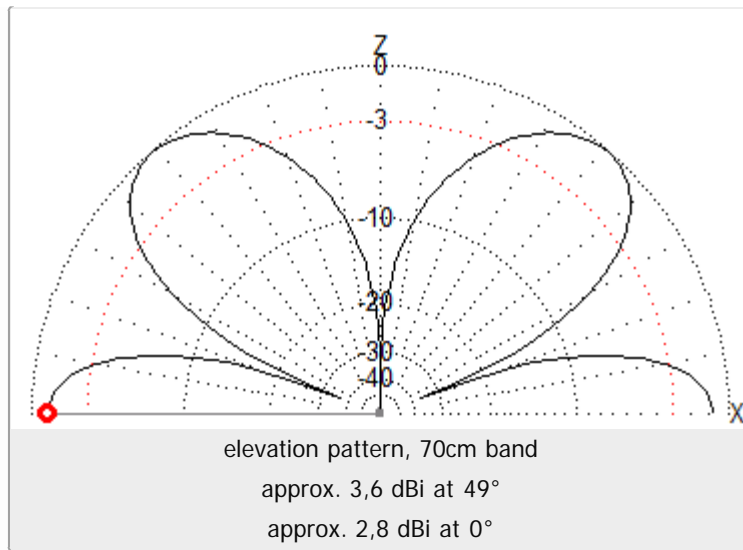
A	360
B	230
C	360
D	288
E	35

The principle of the J-pole antenna is clearly visible. An end-fed radiator (high impedance) is energized via a  $1/4\lambda$ -wave stub (measured on 2m), short-circuited at the lower end. A suitable point of the stub, where the impedance is close to  $50\Omega$  (as we are faced with a quarter-wave stub a more precise explanation would be to say: "[...] where the *admittance* is close to  $1/50 \pm j0 \text{ S}$ "), is picked to connect to the coaxial cable coming from the transceiver.

## Gain and Radiation Pattern

A simulation of the antenna (with [MMANA](#)) calculates a gain (in free space) of approximately 2.1 dBi on 2m as well as approximately 3.6 dBi on 70cm. Unfortunately, on 70cm this gain is only achieved into a rather undesired direction around an elevation angle of  $49^\circ$ . However, at the preferred direction of  $0^\circ$  there is a strong sidelobe with a gain of approximately 2.8 dBi. With an omnidirectional pattern in the horizontal plane, the elevation patterns (in free space) are depicted here:





I have not been presenting "the miraculously new and ultimate dualband antenna" here. Nonetheless, what has been presented here is a simple and very easy to build VHF/UHF antenna, which – for the needs of many radio amateurs – should be sufficient for local area communication or relay operation. This antenna can cope with many commercially available antennas – but only costs a fraction of the price.

## Derivation of the radiation patterns

My previously published radiation patterns concerning the 70cm band turned out to be wrong. They showed a too flat pattern and predicted too much gain. In many emails I received, several radio amateurs pointed this out. Comparing the PA0FBK antenna to another vertical antenna with a well known pattern, a huge discrepancy between measured and predicted field strengths became obvious. I therefore decided to remodel the antenna in order to understand what went wrong. The result led to the radiation patterns and gain figures published above, for more information on this topic please refer to my second article on this antenna: [□ Dreams and Reality - Demystifying the PA0FBK antenna](#)

DL8KDL – June 15, 2013