Hints for Matching Endfed Halfwave Dipoles

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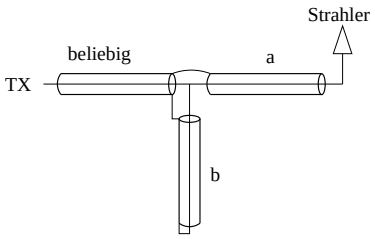
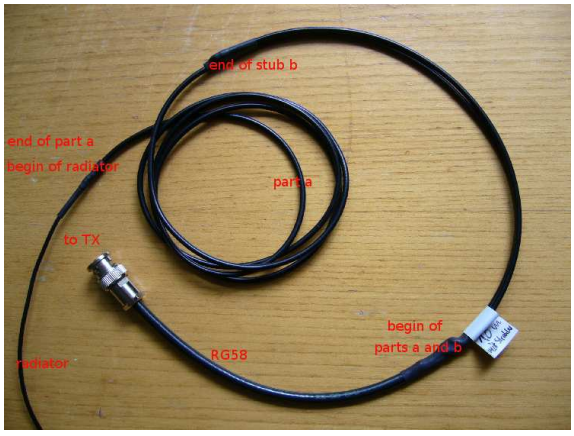
An endfed vertical halfwave dipole is really an ideal portable antenna for 10m up to 20m because it can be turned quickly around a fibreglass mast and does not need any radials. However, the high impedance of the dipole has to be matched to the 50Ω output of the transmitter. A well-known alternative to a Fuchs circuit is a quarterwave matching line for each band. Unfortunately the dimensions of the stub are quite critical. A simple analyser like the miniVNA of mRS is of great help because it enables to see at one glance where the antenna is resonant. Fine tuning can be done by choosing the stub a bit too long and shortening the sheath and the inner conductor by a needle. Change the position of the needle for optimal matching.

Stub. Both parts a and b of the matching line are made of good coaxial cable RG174U with dense sheath. The lengths given in the picture are the lengths of the sections which are envelopped by the sheath of the coax. At the stub junction the inner conductors stick out about 1cm and are soldered together; the sheaths as well. The coax to the transceiver is RG58U. The following values yield quite reproducible results. They are approximately $L = 0,484 \cdot \lambda$, $a = 0,139 \cdot \lambda$, and $b = 0,027 \cdot \lambda$.

band	λ [m]	a [m]	b [m]	radiator length L [m]
10m	10,52	1,46	0,29	5,10
12m	12,04	1,67	0,33	5,84
15m	14,14	1,97	0,39	6,85
17m	16,56	2,30	0,45	8,03
20m	21,14	2,95	0,58	10,25



Radiator. The radiator is made of one strand of a twin cable NYFAZ $2 \times 0,75mm^2$. In order to avoid retracting the mast completely when changing the band the upper part of the radiator with length 5,10 m is used for all bands. The remainder part with length L-5,10 m is soldered to the end of the matching line and is exchanged together with the matching line when changing the band. The influence of the environment proved to be not significant if the lower end of radiator is not very close to grounded objects. Usually I put it about 1m over the ground.



Matching line for 10m