

20m Half-Wave End Fed - Stub Matched



<http://www.rsars.org.uk/ELIBRARY/docsants.htm>

A Half wave antenna has a high impedance feed point. This can be matched using a 1/4 wave stub matching section and converts the 40m vertical into an "L"-shaped 20m J-Pole antenna. The 300 ohm feeder used for this purpose must be kept away from the ground.

Vertical antenna wire behaves as
1/4 wave wire @ 40m & 1/2 wave wire @ 20m

Based on **OE3MZC's 20 Metre 1/2 wave end fed antenna article**, that uses 50 ohm coax for his quarter wave matching section, but to further reduce loses this design uses 300 ohm twin feeder with lower loses.

Formulae :

Antenna wire length

Quarter wave = 234/FMhz Feet

Transmission line length

1/4 wave length x VF for line

Where VF = velocity factor of the transmission line

Note To Convert feet to metres x 0.3048)

Theory :

1/4λ end fed Zo= 37- 50 ohms, but 1/2 λ end fed Zo > 2000 ohms

.The transmission line is a matching transformer, where sections A+B = 1/4 λ and at point "C" the Zin = 50 ohms

Stub Construction :

Section A = 3.54m & Section B = 0.75m but this is cut to 1m initially.

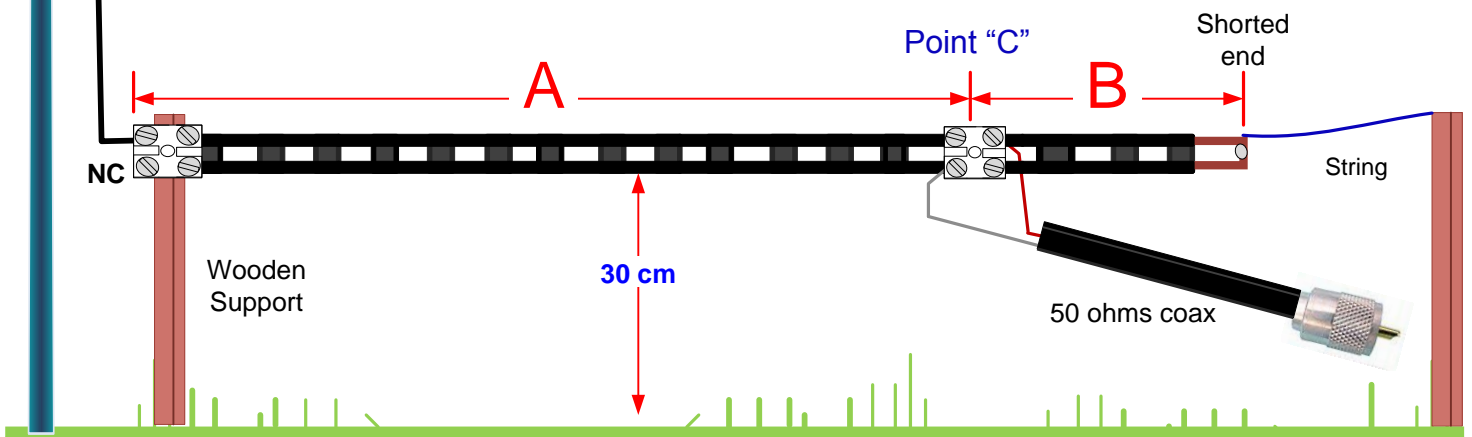
Reduce SWR below 1.3:1 by trimming the shorted section 2.5 cm at a time.

NOTE:

This technique is not restricted to the 20m band, e.g it can be used for other band's 1/2 λ end fed antennas

IMPORTANT :

The matching transmission line must be kept at least 30cm above the ground.



Note NC = No Connection

Graphics by G8ODE 15/11/10 iss 1.3