

EA5AVL 20m Fibreglass Vertical Mobile Antenna



EA5AVL 20m Telescopic Fibreglass
Fishing Pole Antenna

Total weight 3Lbs (1.5 Kg)

*3 Nylon guys may be necessary to stabilise the
antenna in high winds .*

Height at 14.00MHz 11'-1" (3.38m)

Length for transportation 6'-9" (2.1m) and will
fit inside a car easily

A fibreglass fishing pole that is
nominally 4-5 metres long is required
for this design. You may have to
shortened it to open up the throat to
take the end of the Whip section

Fold-over ex-transistor
radio Telescopic
antenna
4 inch (100mm)
adjustment covers
14.00-14.35 MHz

Last piece of wire kept straight
to allow telescopic antenna to
be collapsed during
transportation

9 inch (230mm) Capacity Hat clamped
to the telescopic hinge fixing clamp

The Antenna wire (show in red) is
multistrand PVC covered, and can be
taped onto the fishing pole if desired.

*Start off with a little bit more than 16'8"
(5.1m) and trim for a Min SWR.*

Antenna wire

Short wire from
Centre pin to Washer

The PL259 neck is extended with
short piece of copper pipe that is
glue in with epoxy resin . A hole is
drilled in the tube so that the bolt,
washer & wing nut can be inserted.

PL259 Connector
Araldited to 5 metre
fibre glass fishing rod.

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Readings taken with an MFJ 296 Antenna Analyser 13Aug/2008

20 M Fishing Pole Vertical Mobile Antenna			
Freq MHz	SWR	Match Ohms	Efficiency %
14.00	1.2	56	99
14.10	1.1	50	99
14.20	1.1	46	99
14.30	1.2	45	99
14.350	1.3	43	98

Tuning the Antenna

This is best done with an Antenna Analyser, but with care a transceiver on low power and a good quality SWR meter will suffice. If using an SWR meter then a Cross-Needle meter is recommended, other types need the Forward Power resetting to full scale every time the antenna is shortened and its impedance changes, causing the forward power to change.

Using the Formula for a 1/4 wave = $234 / \text{Frequency (MHz)}$

14.000 MHz = 16' 8" (5.1m approx)

14.350 MHz = 16' 4" (5.0m approx)

Thus 4" (100mm) change in antenna length will shift the frequency by 350 KHz. The incorporated small telescopic antenna will easily accommodate this change and ensure the SWR is always kept to a minimum.

With the Telescopic antenna fully extended and Antenna Analyser or Transceiver set to 14.000MHz.

Starting with a slightly oversize length of wire carefully spiral this around the fibre glass fishing pole and attach as shown in the diagram. Secure the wire to the telescopic whip, and wing nut and washer at the base of the antenna have been provided to facilitate tuning. Check the SWR, and start to trim the wire by about ½ inch (10mm) at a time. After the wire is re-secured recheck the SWR. Continue until the SWR is close to 1.3:1 or better.

As the tuning progresses it will also be necessary to re-adjust the spiralling of the wire on the fishing rod.

Finally set the frequency to 14.350MHz and lower the Telescopic antenna by 4" (100mm),

Re-check that the SWR is still somewhere close to 1.3:1 or better.

However the telescopic whip top section can be replaced with a stiff wire, and the antenna simply tuned up to mid band on 14.175MHz. The SWR will still be less than 1.3 between 14.000MHz to 14.350 MHz.

If used on a car the addition of good earth spike from body car chassis to earth will improve VSWR readings and performance.

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"Here's one I made earlier " EA5AVL



Demonstrating how to Stabilise the boot mounted antenna for static operation in windy conditions



Close-up of the antenna mounting. The antenna is basically self supporting and can be used like this when the weather conditions are calm.



Photograph showing the four spoke of the "Top-Hat" capacitor . The joint to the antenna wire is protected with silicone bath sealant.



The 20m and the 5-Band Vertical antenna prior being loaded for the holiday in Andorra Sept 08.

The 20m antenna is simple and cheap to make, and has a performance that matches commercial antennas but at cost considerably lower. The design was purposely based on a telescoping fibre glass fishing rod as this allows it to be easily stowed away in the car.

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(G8ODE Alternate Method for PL259 Mounting)



The End of this fishing rod had a nylon screw-on cap that held a rubber disc in place. The rubber disc was discarded and replaced with a thick brass washer. The washer's hole was enlarged to be very slightly larger than the diameter of the PL259 neck. The PL259 connector was then inserted and soldered into place. The solder flowed over the top of the washer, and down the slight gap between the washer and Connector's neck. This helps to positively secure the PL259 connector. After the residue flux was removed, the washer & PL259 connector were inserted into the end cap and put onto the end of the fishing rod and firmly tightened up.

