

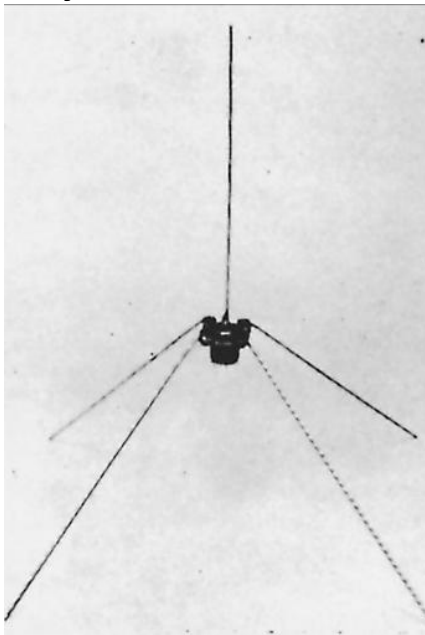
A Simple Dipole for 2 m Band

- A rubber antenna is standard for all FM band transceivers (talkies).
- It is very inefficient !

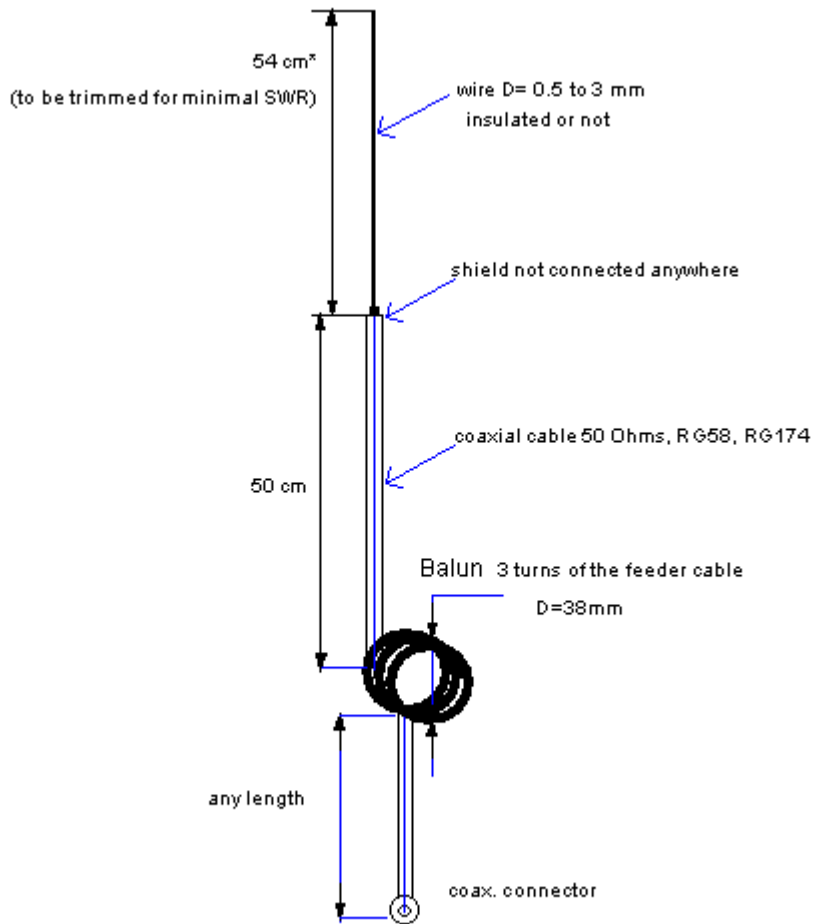


Ground plane

- The most popular simple full sized antenna is ground plane (GP).
- It is efficient - more than 3 times stronger signal compared to a rubber antenna.
- but need space and can not be put easily into a bag- it must be dismantled.
- The mechanical construction is not so easy to build
- Can not be mounted anywhere – it needs mast and clamps



Dipole with choke balun



Remark: With RG174 the best length of the lower arm was 44 to 46 cm, and the upper arm was 47 cm, flexible conductor $d=0.75\text{mm}$, insulation 2.0 mm. The lengths depend on velocity factor of the used wire and cable. With RG58 the lower arm was 47 cm.

How it works?

This dipole has two arms each with wave-length /4 size as any other dipole. Here the upper part of the cable shield acts as a lower arm. At $wl/4$ distance from the feeding point is located the choke balun which stops the antenna currents to propagate along the shield to the rest of the cable. Here the choke balun resonates at 145 MHz and acts as a trap filter so the choke effect is good.

Benefits

- It is extremely compact for transportation and can be put anywhere even in the pocket
- Efficient as a full sized GP
- Can be mounted easily almost anywhere
- Can be built for several minutes
- It is very low cost
- Can be invisible for curious neighbors
- Can be built from scratch materials in the case of emergency

Materials:

1. A piece of thin 50 ohms coaxial cable 1.5 to 2 m length with connector at least from one side
2. A piece of wire, length 54 cm , 0.5 to 3 mm diameter, insulated or not
3. Sticking tape
4. Cable ties
5. Caps from plastic bottles
6. Measurement roulette

Balun construction

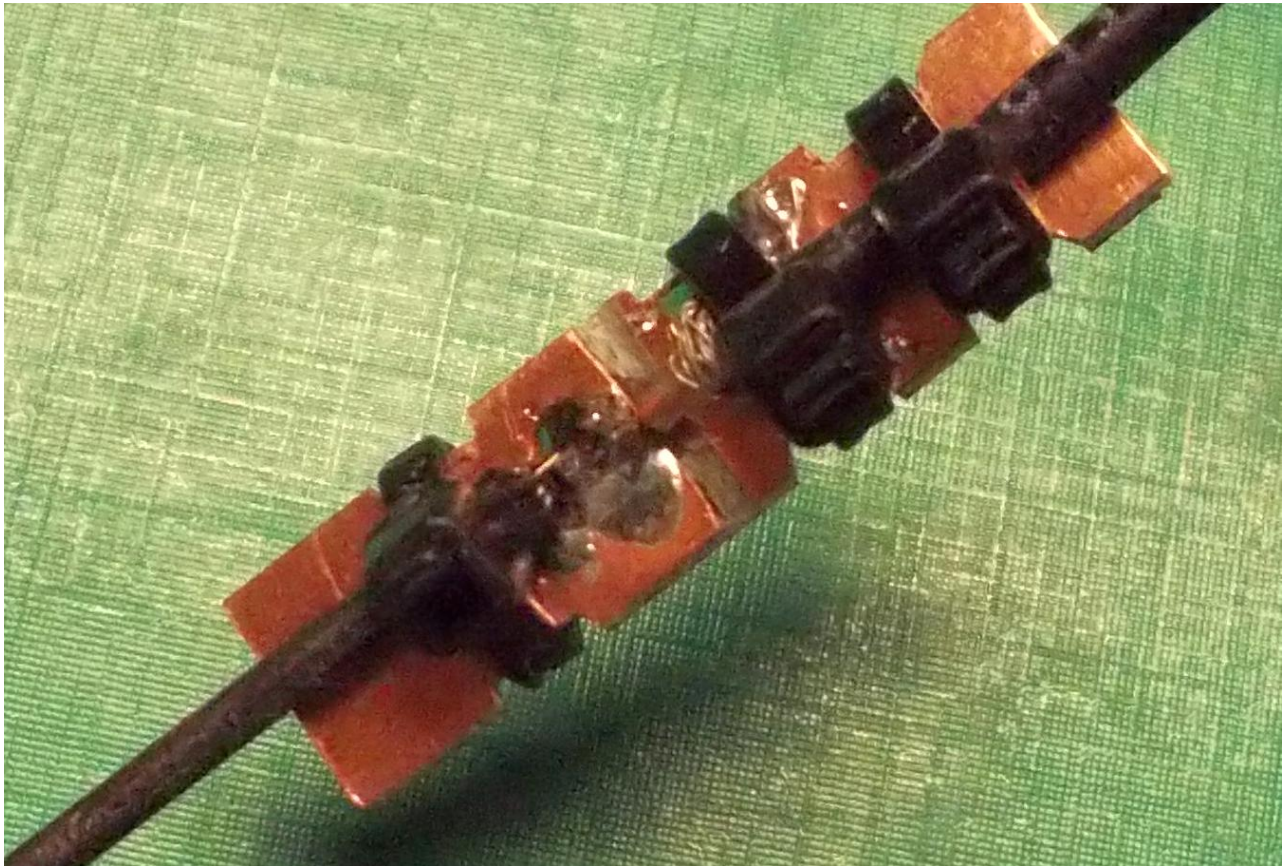
Wind 3 turns of the coaxial feeder on 38 mm cylinder and fix with tape. 38 mm diameter is for RG58 cable (thanks to G3TXQ). For RG174, 38 mm will work also but smaller diameters might be tested. Not critical, but the best chocking effect will be when balun resonates at 145 MHz. The length of the dipole arm is from the start of the braid to the beginning of the coil.



Feeder connection

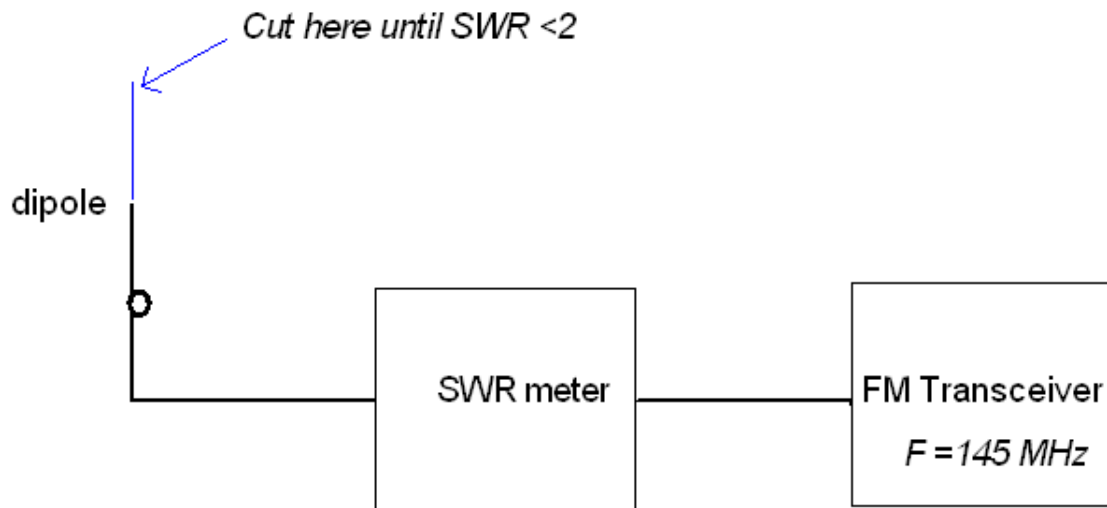


With two BNC connectors



Cable and upper wire are soldered on a single side printed circuit plate and fixed with cable ties.

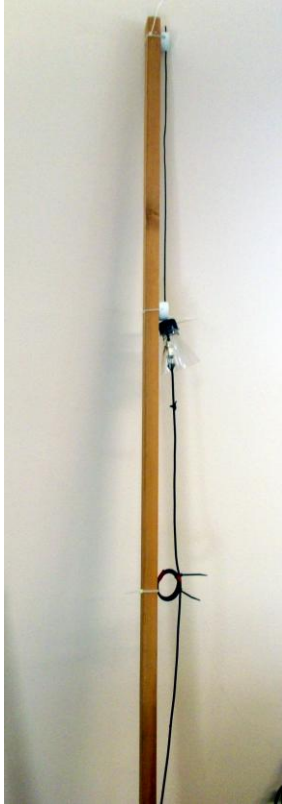
How to tune ?



Cut the upper arm until SWR is acceptable. Minimal SWR measured is 1.3 with feeder length 2 m (including balun turns) . SWR is <2 at 144 to 146 MHz.

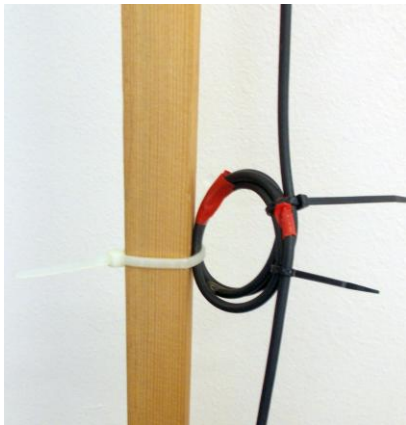
How to mount?

Usually the antenna is mounted vertically for vertical polarization but can be used in horizontal position also.



Version with flex wire as an upper dipole arm

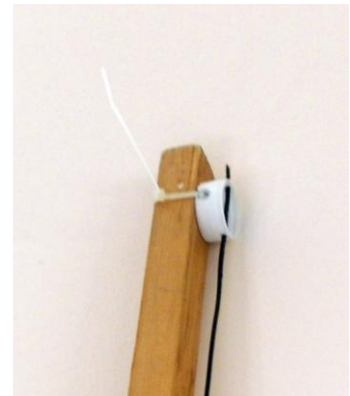
Mounted on wooden stick. Keep the wires 1 - 2 cm from the wood.



Balun



Water protection



Cap as insulator

How to mount?

Version with whip as an upper dipole arm



Whip can be of copper, aluminum , even steel.

You can mount it almost at any place:

On a window



Hanging from a tree



Hanging from radio

Thank you,

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Links:

Kai Siwiak, KE4PT

15 July 2014, Improvised Antennas for Emergency operations

<http://www.arrl.pt/download/file/fid/184>

This antenna serves as an educational tool and was built by 80 young radio amateurs participating in YOTA summer camp held in Bulgaria , August 2019

<https://www.ham-yota.com/>.