CORC Technet Wire Antennas

February 28, 2021

WA8KKN

Wire Antennas for the High Frequency Bands.

1. **Purpose of this CORC Technet**
2. **Real Estate required**
3. **Tools required**
4. **Materials Required**
5. **Types of Antennas**
6. **Testing**

PURPOSE

This session is primarily intended for the new General Class Licensee and/or the experienced ham that has never operated on the HF bands.

Many new licensees studied for the General or Extra and now they are wondering, what do I do next?

a. **Obtain a transceiver (new or used??) New it is hard to beat the IC-7300 for all modes of communications..**
b. **Arrange the Ham shack with comfortable chair, desk, etc…**
c. **Figure out what type of operating and bands you want to use. Most people want SSB on 40/80 Meters due to the sun spots being so low.**
d. **Homemade or Pre-built ….**

Real Estate

The real estate required is band dependent. Obviously, you can NOT put up an effective wire antenna for 80 meters on a 40 ft by 40 ft lot. Probably the best band for a non-compromised wire antenna is 40 Meters and 20 Meters.

Resonant antennas (lengths are approximate and are Frequency Dependent)

160 Meters = 246'

80 Meters = 123'

40 Meters = 65'

20 Meters = 32'

15 Meters = 22'

10 Maters = 16.5

Compromised antennas that do radiate are usually no shorter than 60 feet for 80 Meters.

The antennas can be horizontal or an inverted-vee. In the case of dipoles, try to keep each half of the antenna in a straight line. 10 degrees to 30 degrees deviation is fine. Anything past 60 degrees will not work properly.

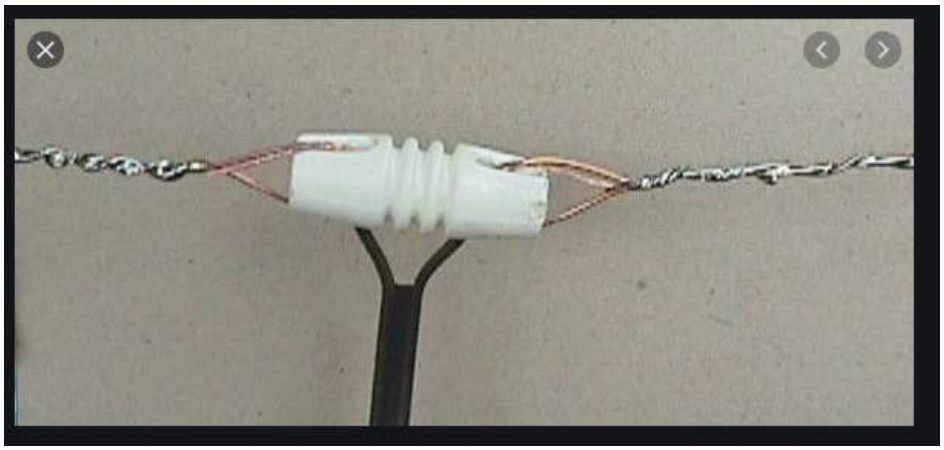
Tools Required (Common to a Home built or a Premade Antenna)

1. **Pliers**
2. **Wire cutters**
3. **Soldering Iron and solder 100 Watts or greater**
4. **Good Electrical tape and/or connector sealer.**
5. **Matches or Propane Torch (used for sealing the end of ropes)**
6. **Sling shot, ball launcher, or a strong arm.**
7. **Fishing line**
8. **Dacron Line**

Materials

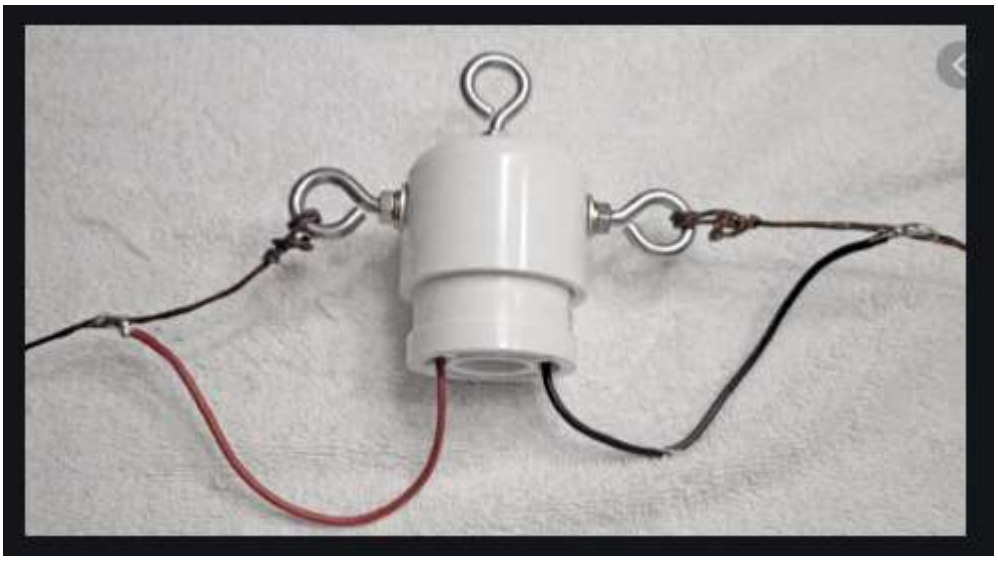
1. **TIME**
2. **Wire (cheap electrical soft drawn copper is OK for Home Brew antennas).**
3. **Galvanized Pulleys**

4. **Insulators (can be Plexiglas, PVC Pipe, Porcelain, etc...)**



5. **Dacron Rope. (Harbor Freight rope can be used with shortened life)**

6. **Center Insulator (Coax type or Ladder line)**



WA1FFL LADDER-LOC™

The Ladder-Loc® is a strain-relief and mounting support for 450-ohm ladder-line. It is UV-stabilized and has a proven field record of durability. Over 15,000 have been shipped to satisfied users.

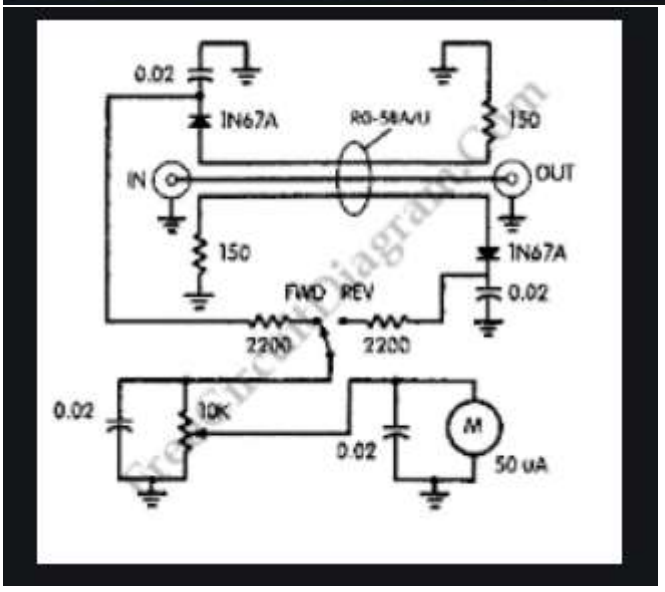
7. Current Balun (Balun Designs)

Model 1115u

Model 1116di

These balluns are for illustrative purposes only.

8. **LOW COST VSWR meter. Nothing fancy … $10 to $40 used. They do NOT read peak power. They read average power only. There is no need for expensive equipment just to get on the air.**

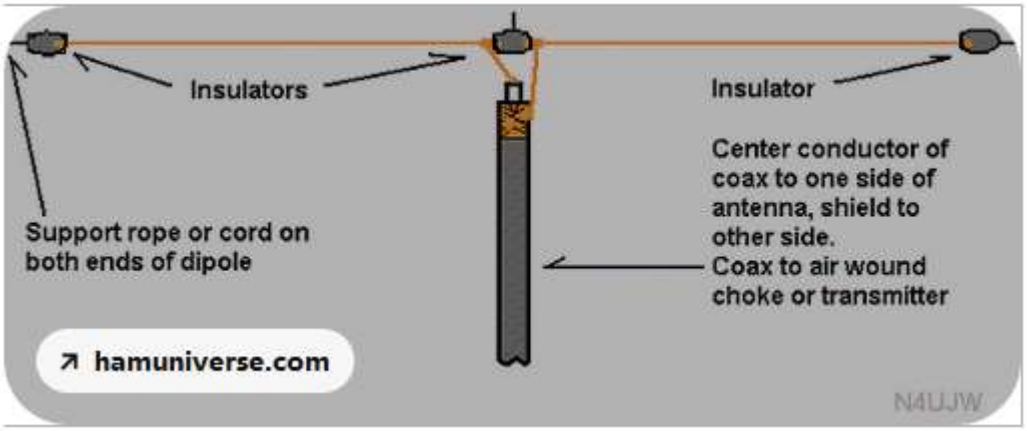


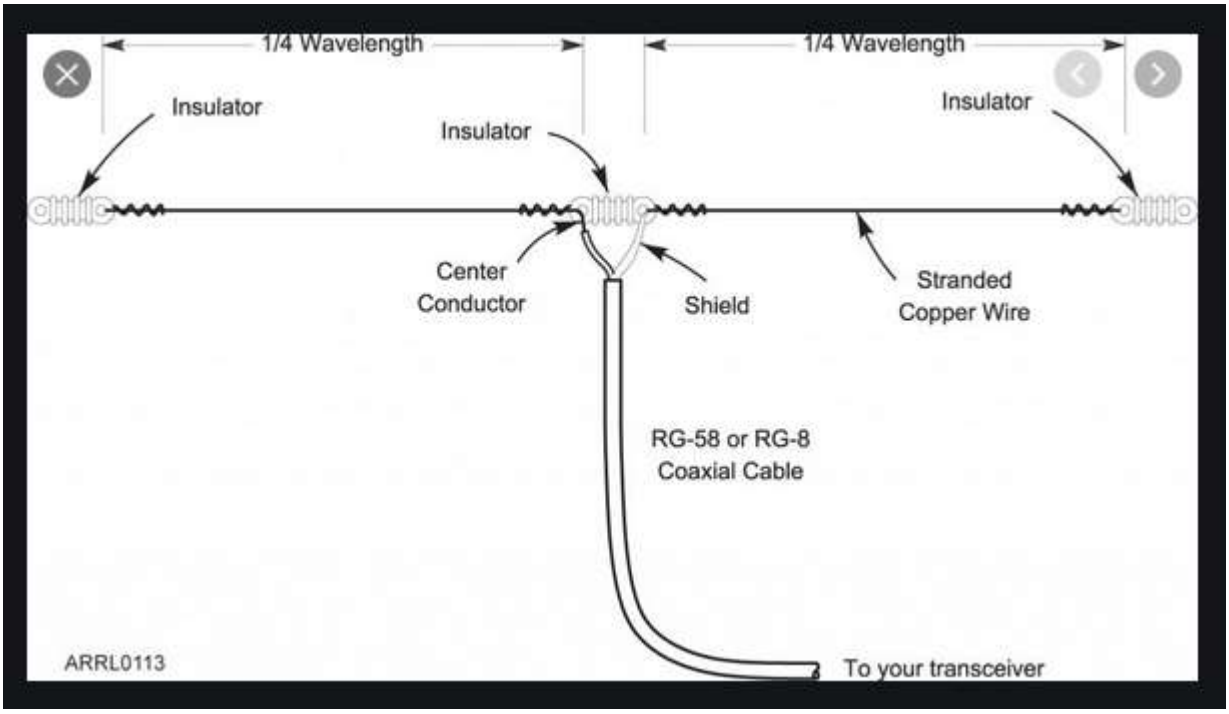
9. **Match Box (aka antenna tuner) …. May not be required for dipoles**

https://www.w8ji.com/antenna_tuners.htm

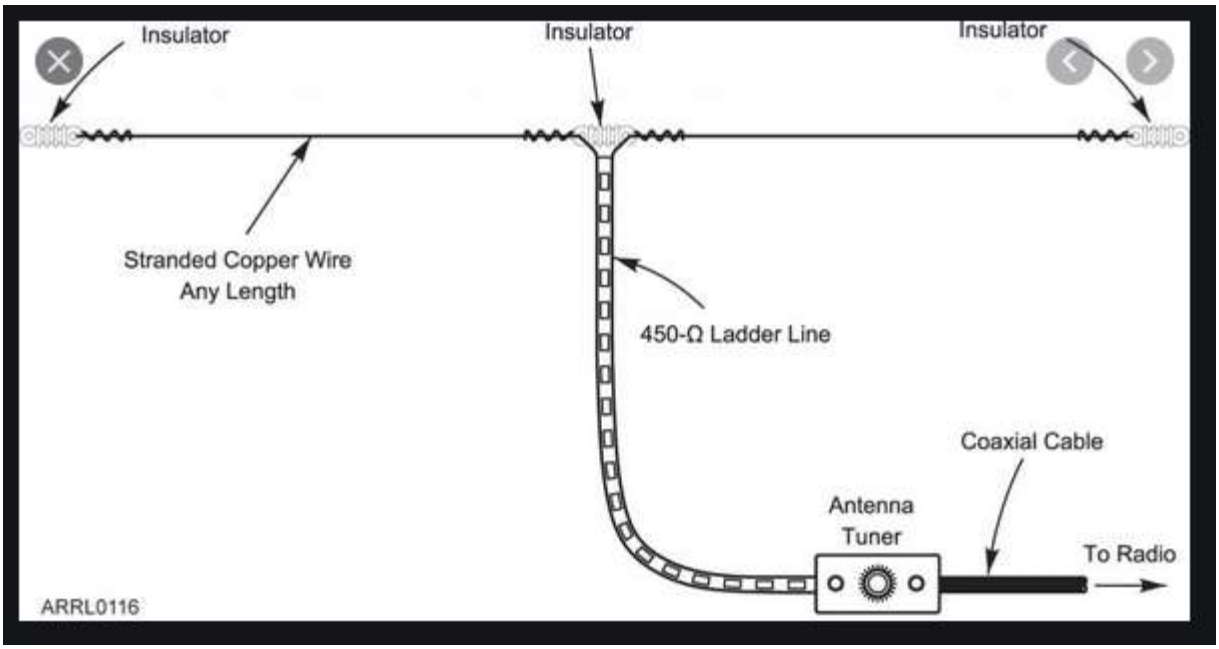
Types of Wire antennas

1. **GENERAL RULE: The more wire and higher the better**
2. **½ Wave Resonant Dipole**

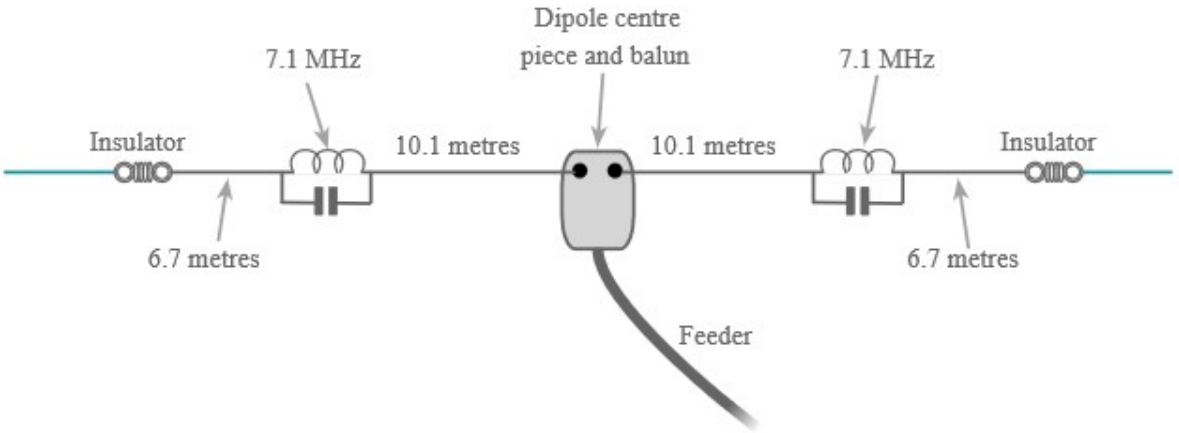




3. **Multi-band Dipole fed with ladder line**

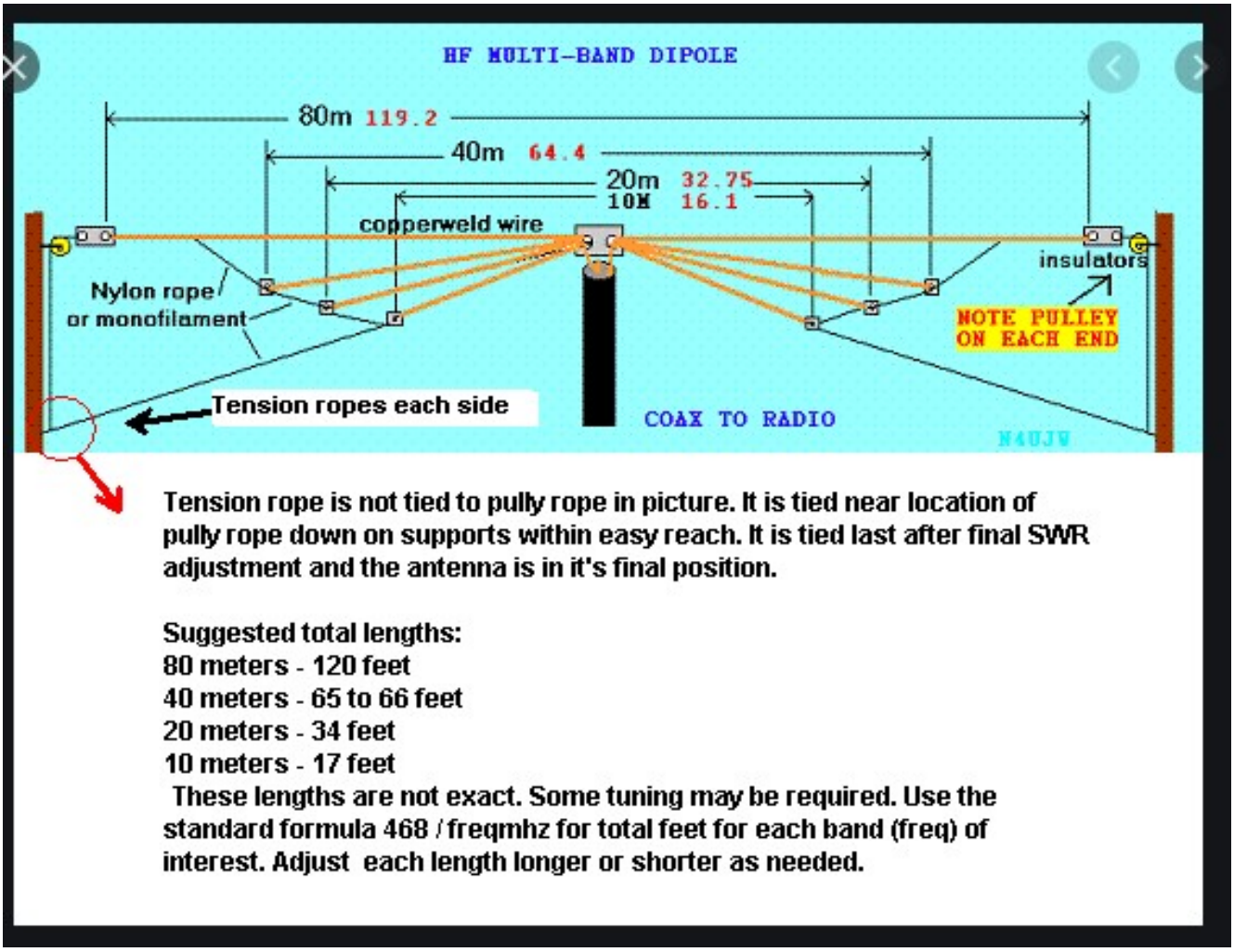


4. Trap antenna



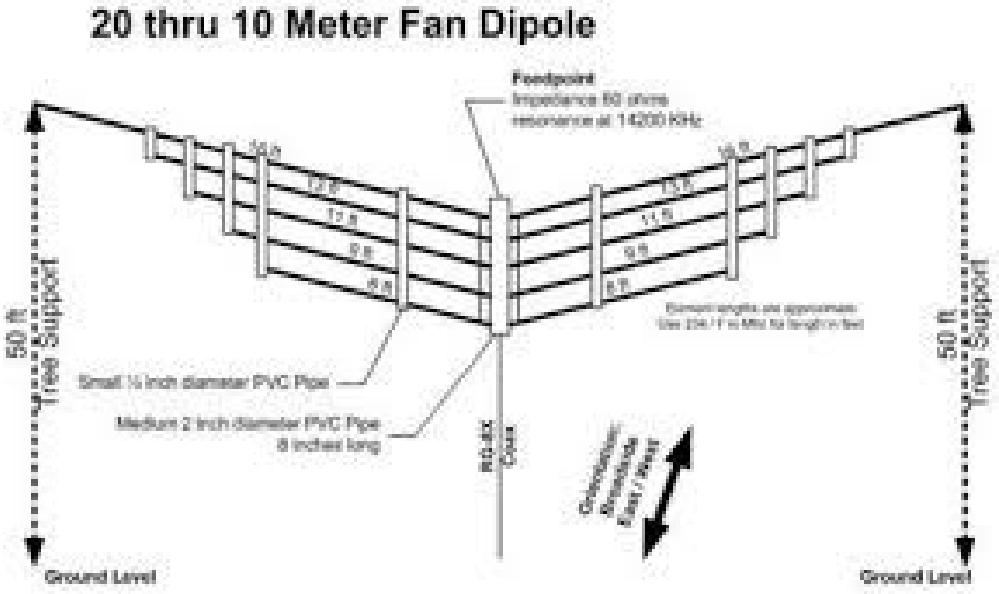
G8KW / W3DZZ multi-band trap dipole

5. Fan Dipole (Coax or Ladder Line)



Tension rope is not tied to pully rope in picture. It is tied near location of pully rope down on supports within easy reach. It is tied last after final SWR adjustment and the antenna is in it's final position.

Suggested total lengths:
80 meters - 120 feet
40 meters - 65 to 66 feet
20 meters - 34 feet
10 meters - 17 feet
These lengths are not exact. Some tuning may be required. Use the standard formula 468 / freqmhz for total feet for each band (freq) of interest. Adjust each length longer or shorter as needed.



The DREADED G5RV antenna.

Be sure to read:

https://www.w8ji.com/g5rv_facts.htm and

https://topbandhams.com/tech-page/14-the-truth-about-the-g5rv-antenna

These antennas require height and a clear area to work.

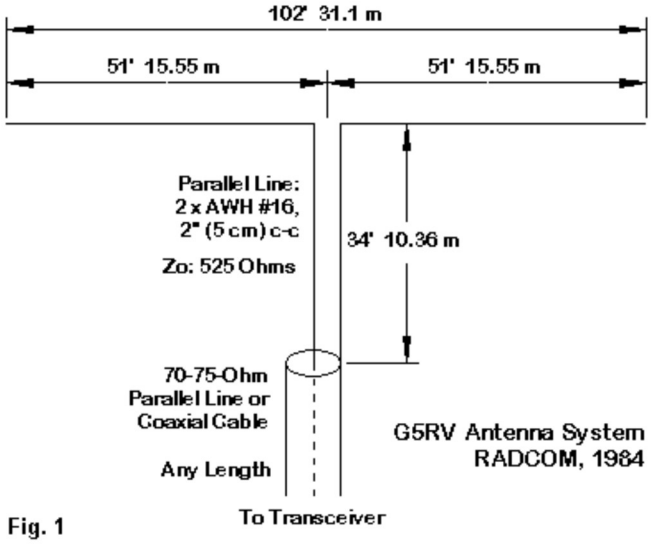
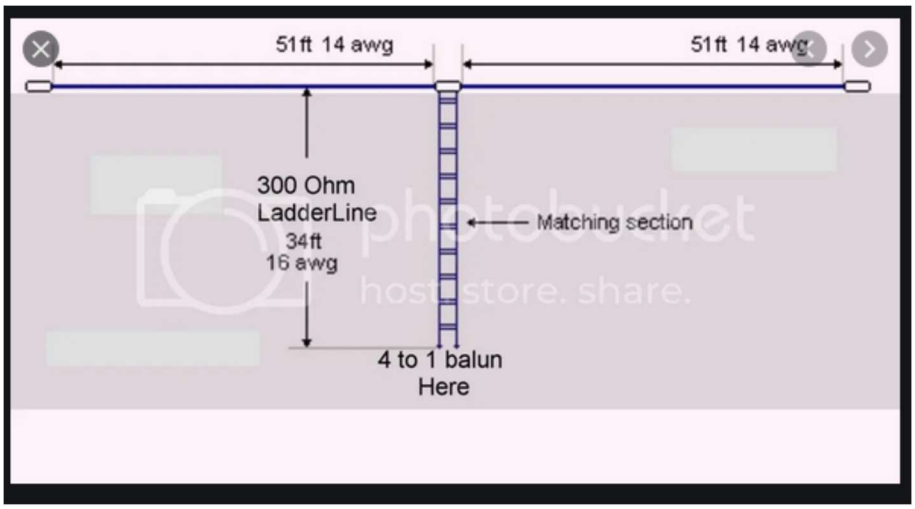
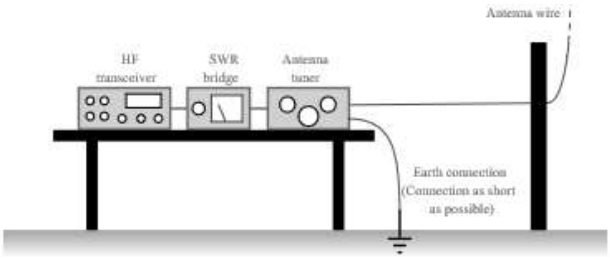


Fig. 1



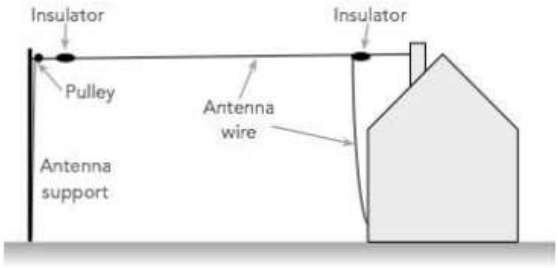
6. **Longwire**

Inside



The station end of an end fed wire (long wire) antenna system

Outside



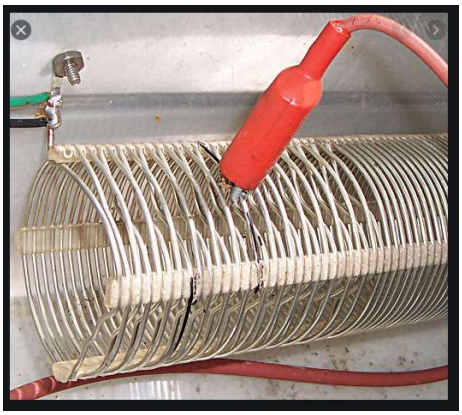
Typical end fed wire antenna
(often referred to as a long wire antenna)

ANTENNA TUNERS or Matching Networks

See: https://www.w8ji.com/antenna_tuners.htm

W8JI discusses the various circuits contained in the antenna tuners.

The Long Wire antenna requires an "L" type arrangement that can be made out of Airdux coils or a coil wound on a paper towel cardboard tube.



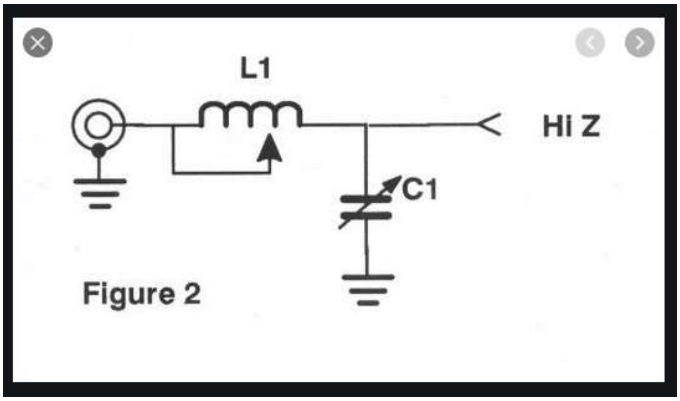
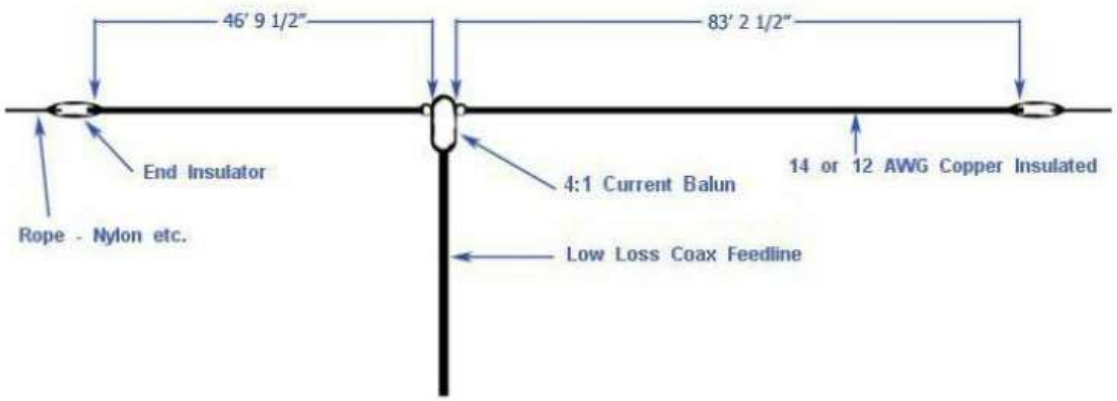


Figure 2

7. Off Center Fed (OCF) antenna (Fed with COAX or Ladder Line)

80Meter



8. **DX Commander**

The “DX Commander” is a vertical equivalent of a Fan Dipole. This antenna is a beast. It requires many ground radials for it to function properly. It does not require a match box. It operates 80 Meters thru 10/6 Meters.

See: https://www.m0mcx.co.uk/store/products/nebula-xtreme-dx-commander-18m-antenna-kit/

9. Two Mobile Antennas Horizontally Configured Using a MFJ – 347 mount

MFJ-347 HAMSTICK/DIPOLE Mount KIT
(for Any 2 HAMSTICKS AS A Base)
Brand: MFJ
47 ratings | 15 answered questions
Amazon's Choice for "hamstick"

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- Build Your own Mini Dipole using 2 Hamsticks
- Mounts on Mast up to 1-1/4" OD
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- 3/8 x 24 Thread

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The mobile antennas "Ham Sticks", "Hustler", or any other mobile antennas are mounted to the 3/8"x24 threaded connectors shown in the blue circles.

This mount must be attached to a *NON METAL* pipe.

Video: https://www.youtube.com/watch?v=SYypZ0Ot55I

And the 8 port model MFJ -2100 which resembles a "Fan Dipole"

Testing

Most new radios have VSWR meters on board along with a limited antenna Impedance matching networks (aka antenna tuner). Thus, there is no need for VSWR meters for the initial station setup.

In the good old days, we used a $10 Heathkit of Knight kit meter. In order to see the VSWR of the antenna, transmitted on various frequencies across the bands to see where the VSWR dips….

If you must, use an external VSWR Meter make sure it has a watt meter that has average AND Peak Reading power measurements. A peak reading meter is handy for SSB and other modes.

KIWI Remote SDR Receivers

Use the kiwi receivers to monitor yourself and see how your antennas are working. These receivers are worldwide.

List of Kiwi receivers: http://kiwisdr.com/public/

Map of Kiwi receivers: http://rx.linkfanel.net/

Use the KISS principle.