

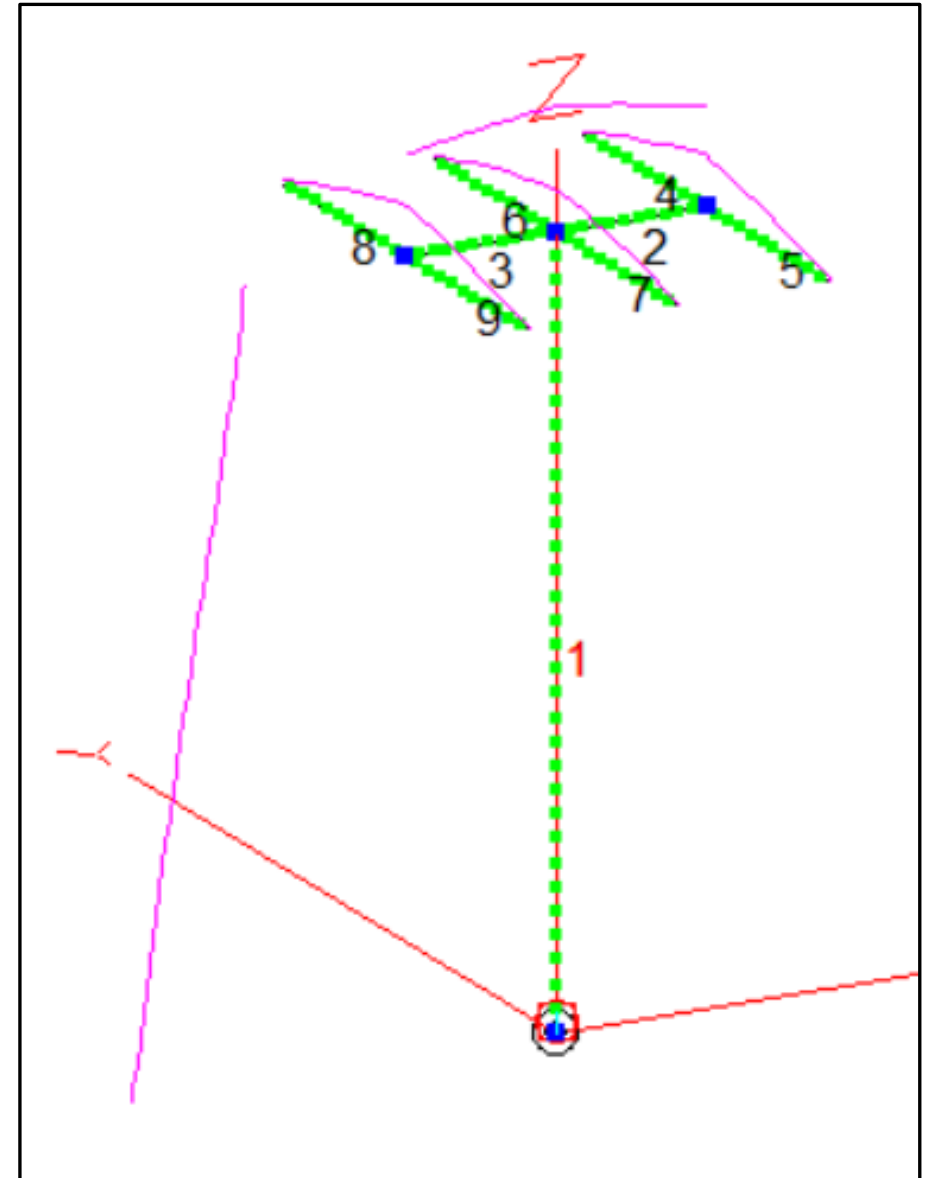
**160m Antenna Ideas For  
The Average QTH  
(That Are Better Than A  
Dummy Load !)  
or  
How To Get On 160m  
And Make A Few Q's!**

**Jon Platt  
W0ZQ**



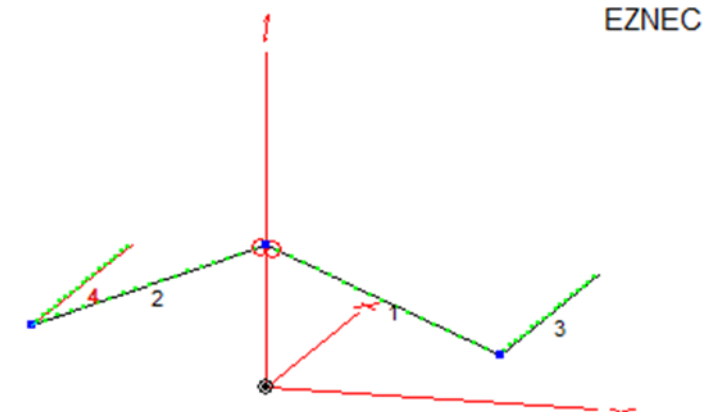
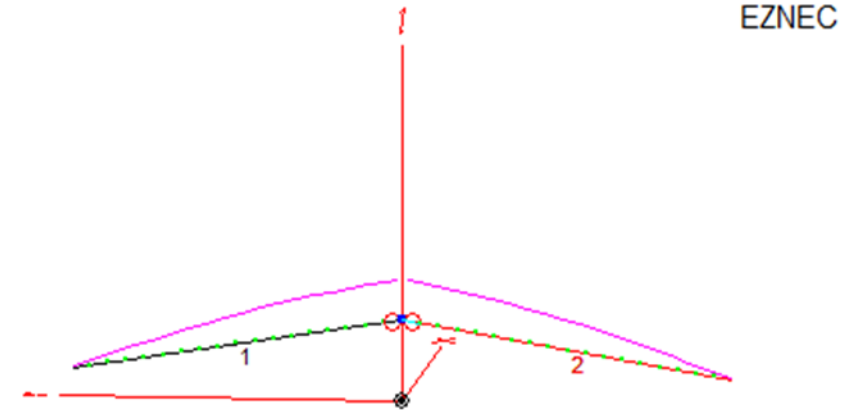
## If You Have A Tower Then Shunt (Gamma) Feed It:

- A 50' Tower with a tribander (or equivalent) should resonate close to 1.8 MHz (53.23 - J 106.4 ohms)
- Run a wire from the top down, feed with a series capacitor. Think of a Gamma Match arm.
- Gamma feed can be slanted from the top down (slant feed).
- GOOGLE "Gamma match tower"
- It's a vertical so it requires ground radials
- Can add a horizontal top wire



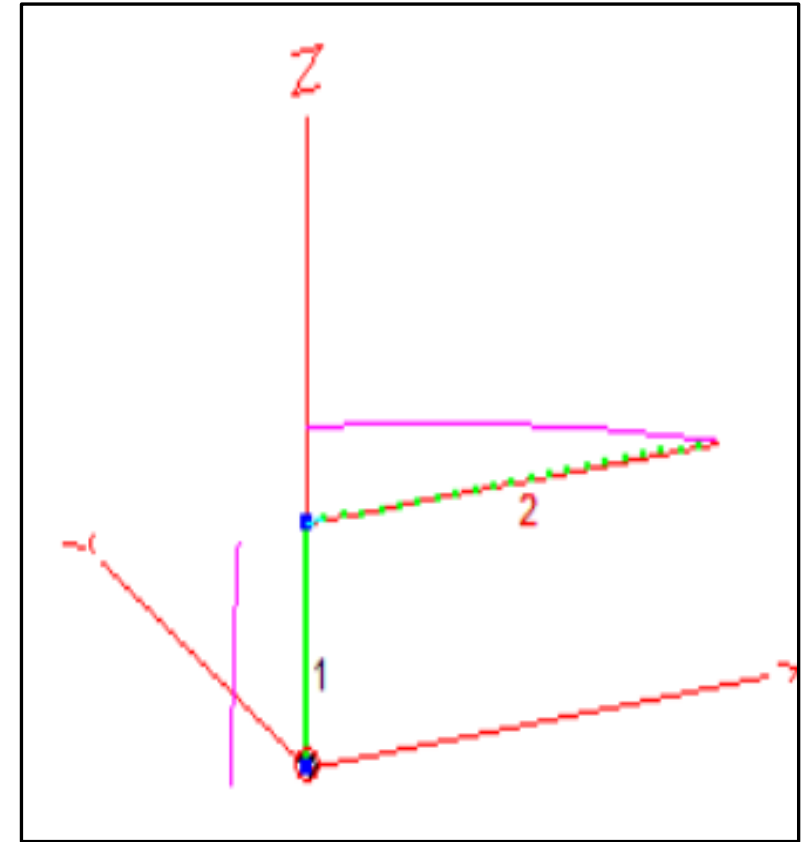
# If You Have A Tower And The Space, Go With A Dipole:

- **A full size dipole end-to-end is about 265 feet.**
- **If you need to you can bend the ends.**
- **Because these dipole are electrically very low (50' = .10 wavelength) their feed impedance will be 25 ohms or lower meaning SWR no better than 2:1.**
- **One advantage is no radials**
- **One disadvantage is it's a cloud burner**



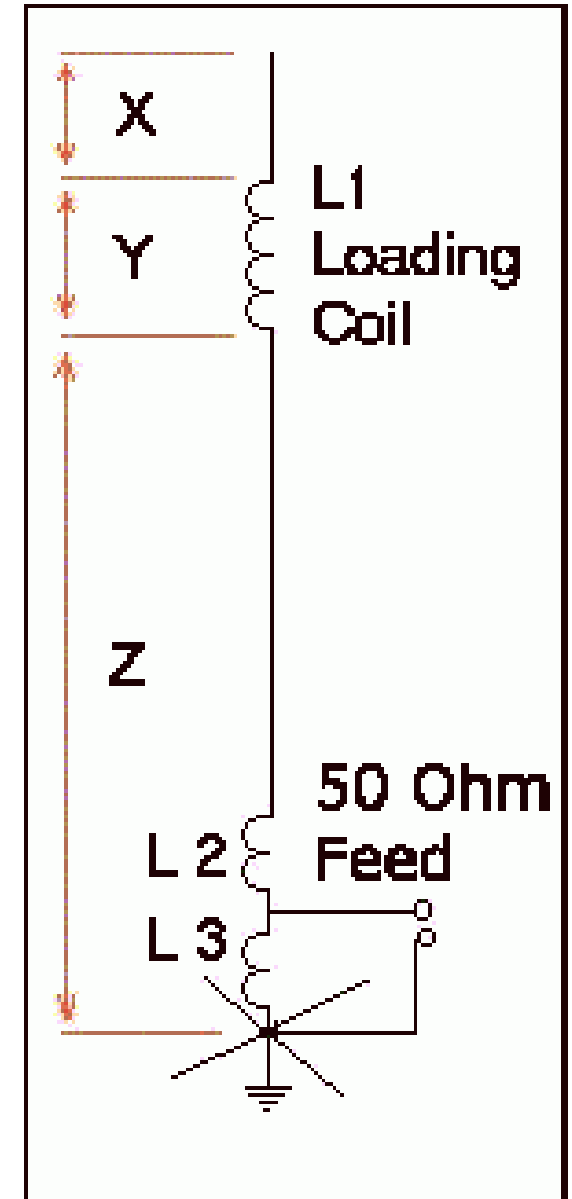
# No Tower, But Have Some Trees, Try An Inverted L

- $\frac{1}{4}$  wavelength of wire fed against ground (radials). It's a bent vertical.
- Try to get as much of the wire as vertical as you can. Slanting upwards is OK.
- Input impedance will be under 30 ohms so expect about a 2:1 SWR with a direct feed.
- If the length is extended to  $\frac{3}{8}$  wavelength ( $\sim 200'$ ) you can tune out the inductive reactance with a series capacitor at the feed point and get closer to a 50 ohm match.
- You can shorten the L's length with inductive or capacitive (end) loading



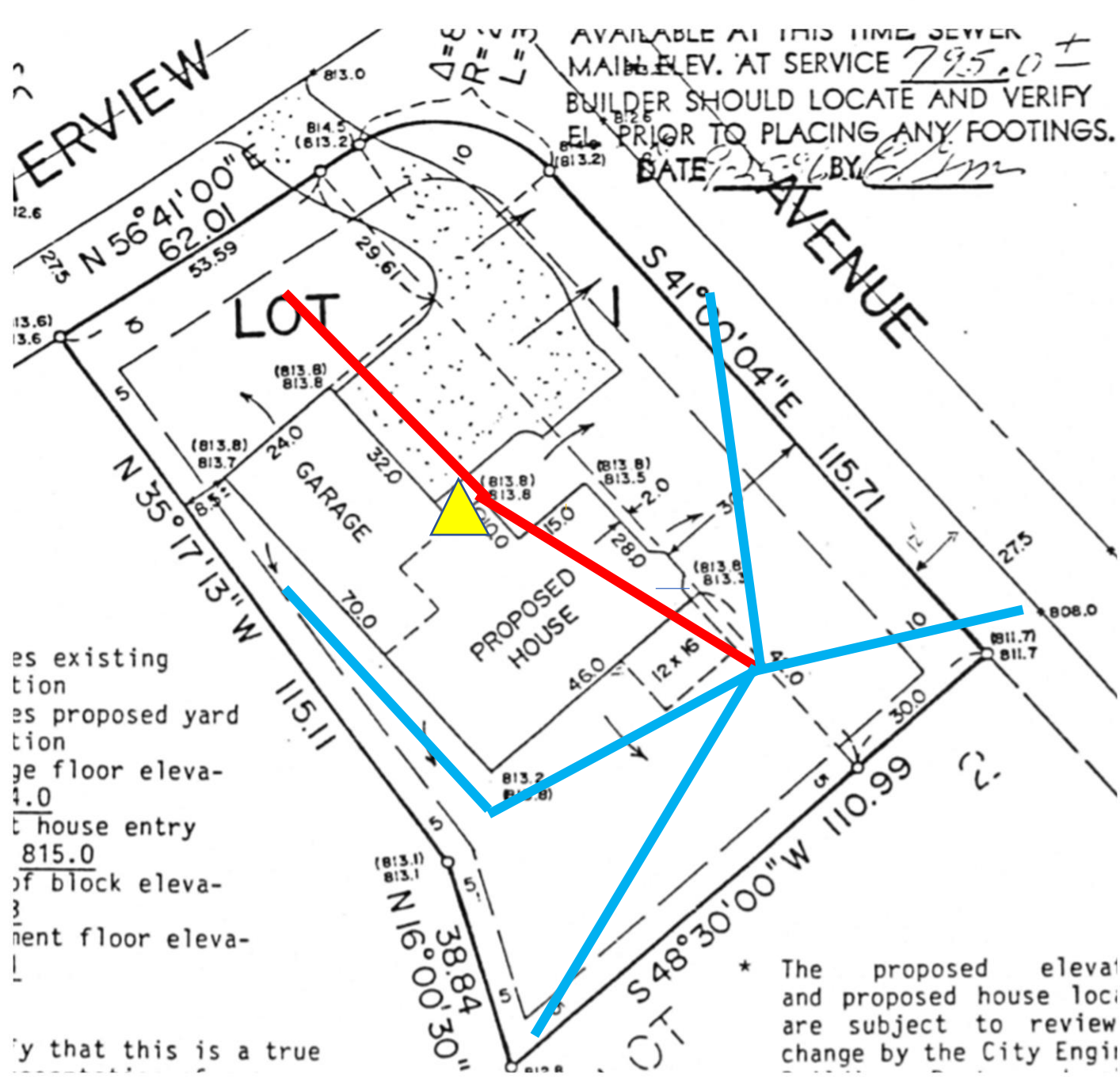
# No Tower, No Trees? Approach It Like A “Big” HF Mobile Antenna

- **Vertical with base or center loading**
- **Make the vertical as tall as possible**
- **Add top loading as much as possible**
- **It’s a vertical so it needs radials**
- **Because its electrically short it will have a low input impedance that will require some sort of matching network such as a Hairpin.**
- **Bandwidth will be narrow.**
- **Lots of homebrew ideas on the Internet. Google “Short 160m verticals”.**



# Ground Radials

- **There are two kinds of radials and they work differently. Elevated radials are resonate ( $\frac{1}{4}$  wavelength) while ground mounted radials are not resonate and *can be* any length.**
- **Google N6LF for “*Design of radial ground systems*” and “*Is There A Relationship Between Vertical Height And Optimum Radial Length*”.**
- **“Thumb Rules” for short verticals:**
  - **Radials should be *about* as long as the vertical is tall.**
  - **For a given length of available wire more short radials is better than a few long radials.**
  - **For a half size 160m vertical radials can be ~ 67’ long ( $\frac{1}{8}$  wavelength) or shorter, just keep adding them as you have wire.**
  - **Use at least 8 radials with diminishing return after 32 radials.**



# W0ZQ Antenna Farm

## Bent 1/4 Wave Wire

- **135 feet of wire (red)**
- **Runs vertically ~ 20', then slants up to my 50' tower, then down to a tree**
- **Direct fed at ground level with RG8**
- **Because ground losses are probably "high", SWR is moderately broad.**
- **It "WORKS" !**

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## **Summary:**

- **If you have a tower shunt feed it**
- **If you have the space build a dipole. Fold the ends if needed in order to fit it in.**
- **If you have trees go with an inverted L. Get as much wire vertical, or slanted vertical, as possible.**
- **If you have no tower nor trees build a short loaded vertical. Think about it being a “big” mobile antenna.**
- **For verticals, more shorter radials are better than fewer longer radials. At a minimum use eight radials ~ 67’ long. To upgrade add more radials, not longer radials.**
- **Lots of help available on [MWA@w0aa.org](mailto:MWA@w0aa.org)**

**CU on 160m, 73**