

# Antenna Solutions

FRRL Program

April 10, 2007

AH6EZ

# Antennas are all about tradeoffs

- Cheap vs Expensive ?
- Huge and Tall vs Small and Unobtrusive ?
- Efficient vs Inefficient ?
- Multiband vs Single band ?
- Robust and long-lasting vs Weak and short-lived ?
- Local QSOs vs DX ?
- Single support, Multiple, or Ground Mounted ?
- Low or high power handling ?
- Resonant or no resonant ?
- Self constructed, gradual learning by doing vs proven commercial

# Constrained by your environment

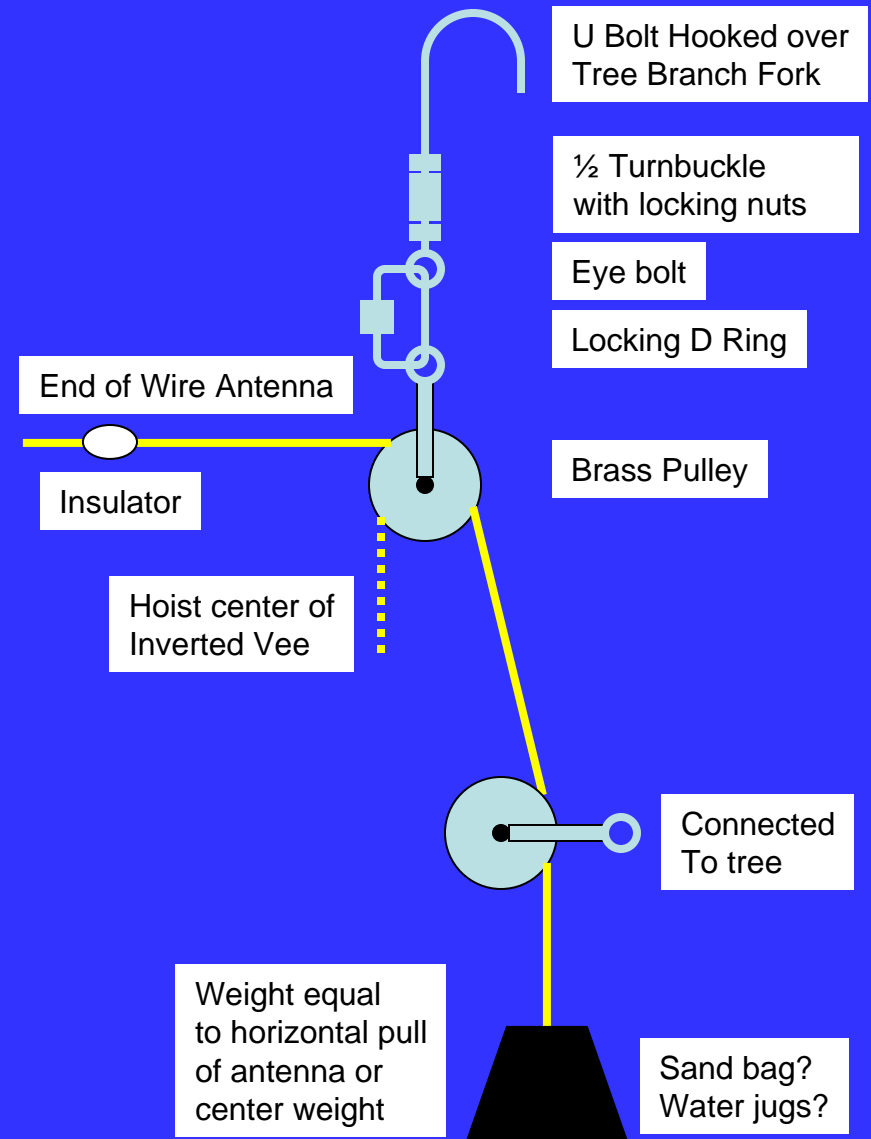
- Indoor or outdoor ?
- Small or large lot ?
- Proximity to power lines ?
- Attic space ?
- Sturdy trees ?
- Chimney or roof tripod ?
- Attic, upper floor, or basement shack ?
- Yard space for radials ?
- Spouse friendly ?
- Neighbor friendly ?
- Deed or covenant restrictions ?

# Trees – Friends or Foes

- If tall and sturdy, they make great supports for wire antennas. Remember counter weights
- Trees can also be in the wrong places
  - Get in the way of rotatable antennas
  - Too close together or not far enough away

# Recommendations for Counter Weighting

- Use a fixed pulley to hoist the end/middle of a wire antenna
- Keep tension on wire antenna while allowing wind to move the trees (and move weight up and down)
- Paint everything flat color to match surroundings



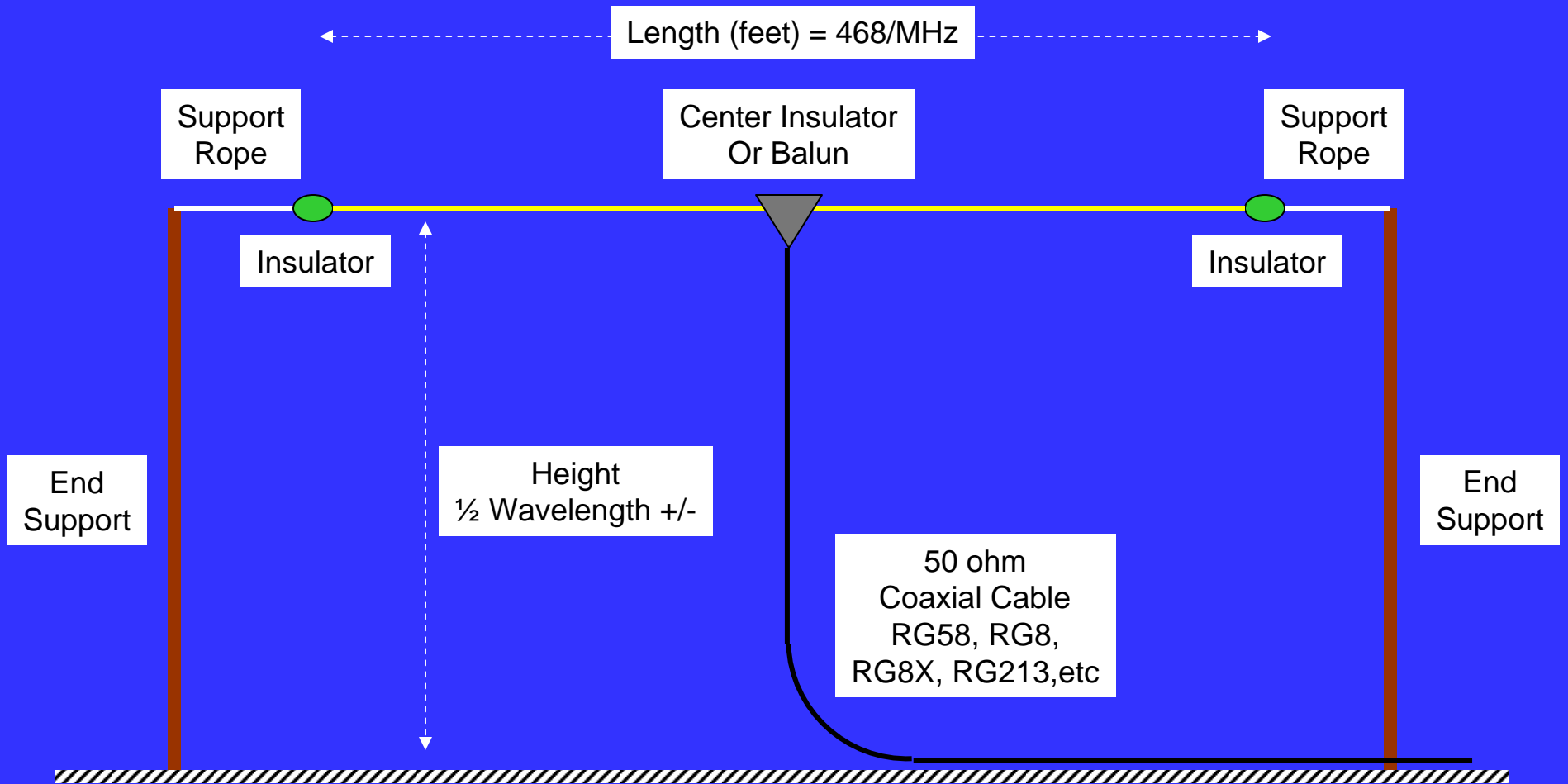
# HF Antennas are all about geometry

- Higher and longer better than low and short
- Two supports generally mean a dipole
- One support generally means inverted vee
- No support generally means vertical
- A tower can provide rotatable antennas with gain on transmit and receive
- Attic space generally dipole but could be low noise receive horizontal loop

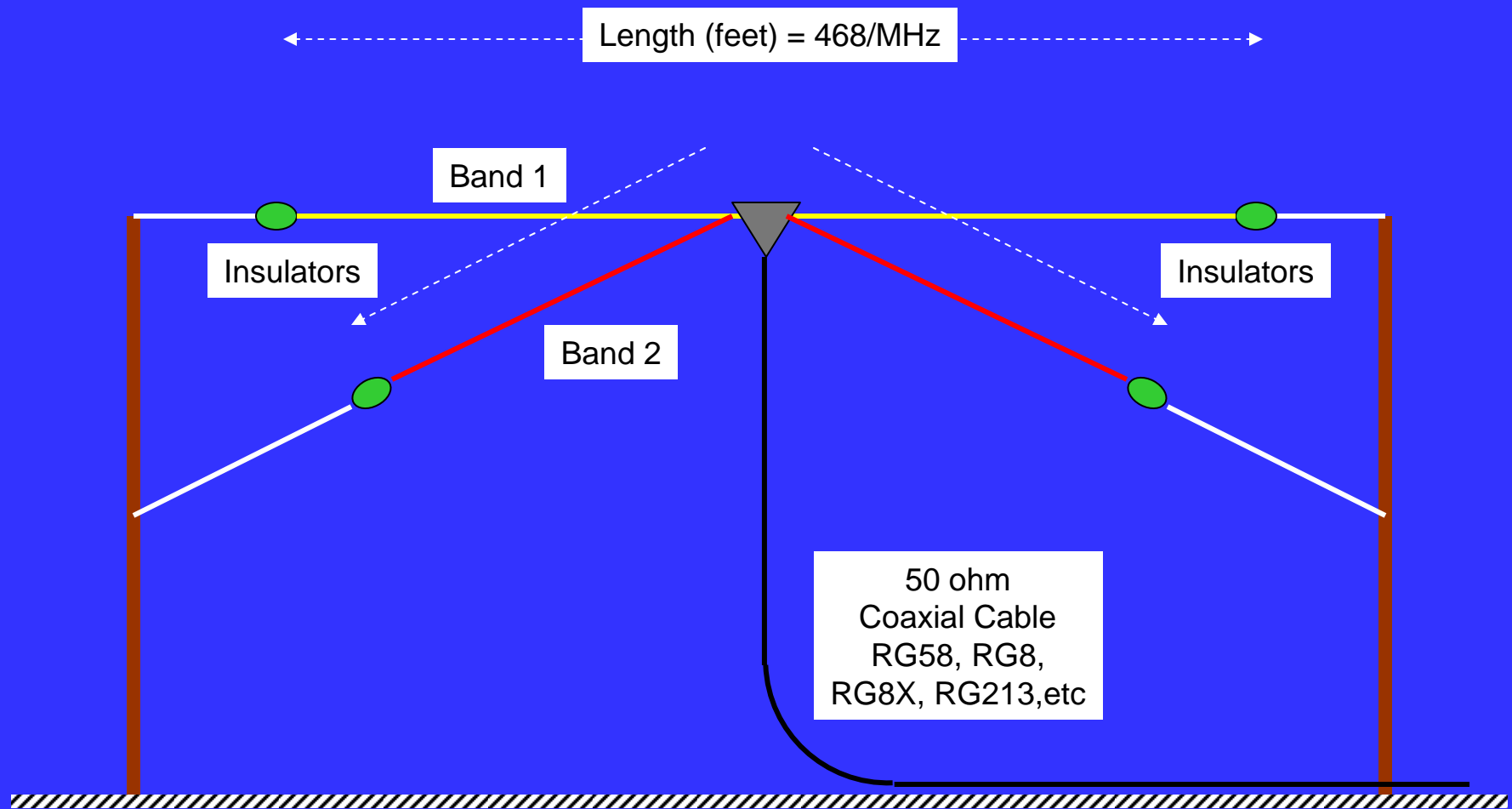
# Antenna Factors

- Radiating efficiency
- Durability
- Cost
- Grounding
- Take off angle
- Antenna lobes
- RF Bandwidth
- Shack location and transmission line entry
- RF interference to self and neighbors
- Power line and other man made noise
- Visibility to spouse and neighbors
- Electromagnetic Safety

# Basic Dipole



# Multiband Dipole



More efficient at radiating transmitter harmonics, some length interaction between bands

# Inverted Vee

Length (feet) = longer than  $468/\text{MHz}$

Single Support

Insulator

Insulator

Not less  
Than 90  
Degree  
angle

Tied to ground, fence, shed, weak tree, etc.

