Portable HF Antennas

KF9UP – Jeff Stewart

Portable HF Options

- Vertical Antenna
- End Fed Half-Wave (EFHW)
- Dipole Antenna
- Magnetic Loop Antenna

Single Band Vertical

Hamsticks / Hustler Resonators / WRC Sporty Forty

Tune by adjusting length of antenna / stinger

Single Band Vertical

- Simple / quick setup
- Low cost
- Several Mounting options
- Need a good ground plane / counterpoise
- Narrow bandwidth on lower bands
- Swap antennas to change bands

Multi-band Vertical

Telescoping Whip

- Change bands by adjusting whip length

Tapped Coil

- Change bands be changing the coil length

Multiple Elements or Resonances

- Band changes are automagical

Telescoping Whip

- A 217 inch whip will tune on 20 meters
- Shorten the whip to tune the higher bands
- Add a coil for 40 or 80 meters

Tapped Coils

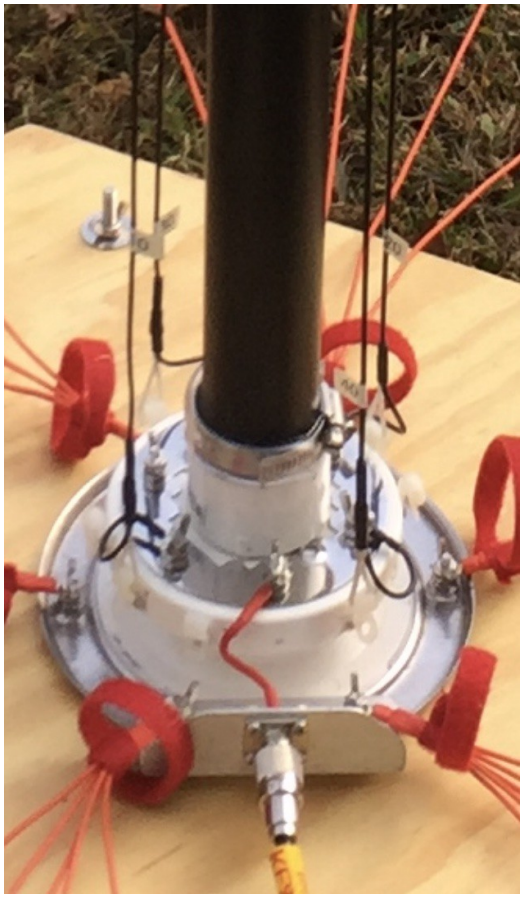
Change bands by adjusting the effective length of the coil

- Wolf River Coils Silver Bullet
- Super Antenna
- Buddistick
- Chameleon MCC Coil
- Outbacker
- Screwdriver Antenna (Tarheel)
- Yaesu ATAS 25 and ATAS 120A

Tapped Coils

Multiple Elements

Multiple Hamsticks



DX Commander

Multiple Resonance

Chameleon MPAS 2.0

EFHW (configured as a vertical or inverted L)

Multi-Band Vertical

Similar to Single Band Verticals

- Need a good ground plane / counterpoise
- Generally, easier to switch bands
- Can be tricky to tune tapped coils
- More expensive

Vertical Antenna Mounts

- Ground stake
- Clamp
- Tripod
- Mobile

Radials

Ground mounted Verticals

- Radial length is not important
- More radials is usually better

Elevated Verticals

- Elevated radials
- Radial length matters (¼ wave of lowest band)
- Bare (uninsulated) radials can be coiled at end to shorten

End Fed Half Wave (EFHV)

Multi-band Antenna

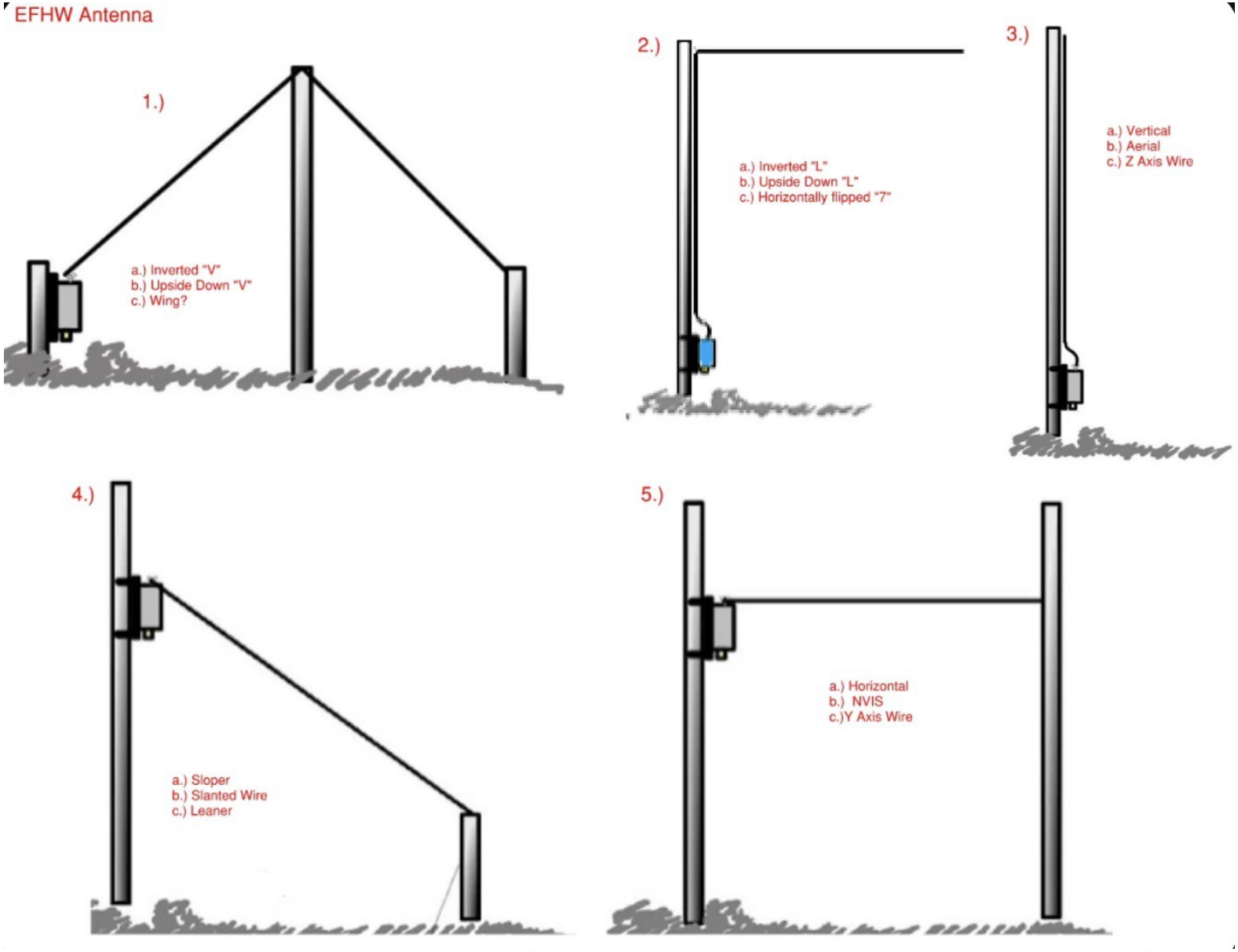
May require an external tuner

Can be deployed in several configurations

Counterpoise needed?

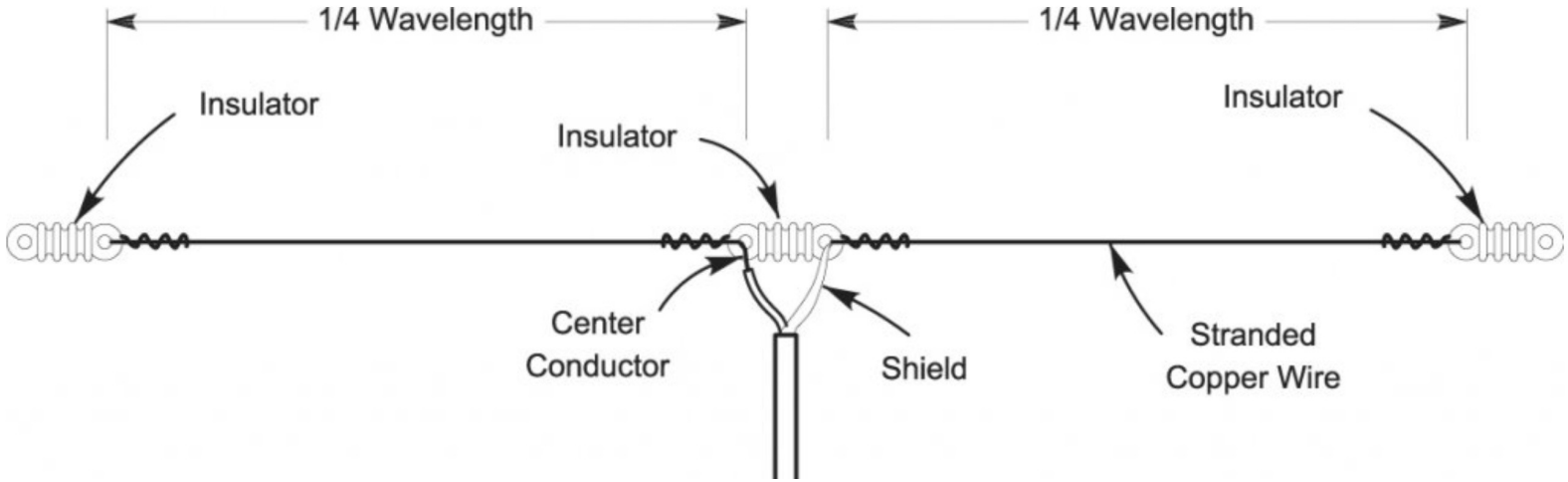
(may depend on configuration)

End Fed Half Wave (EFHV)

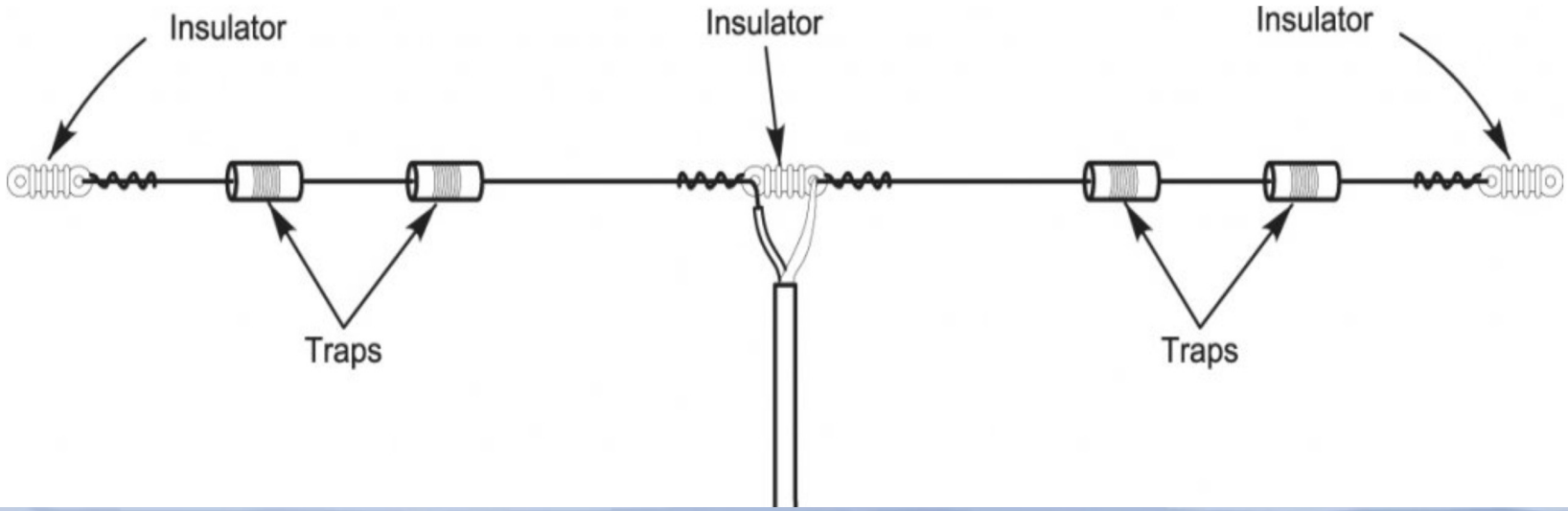


Dipoles

- Single band dipole

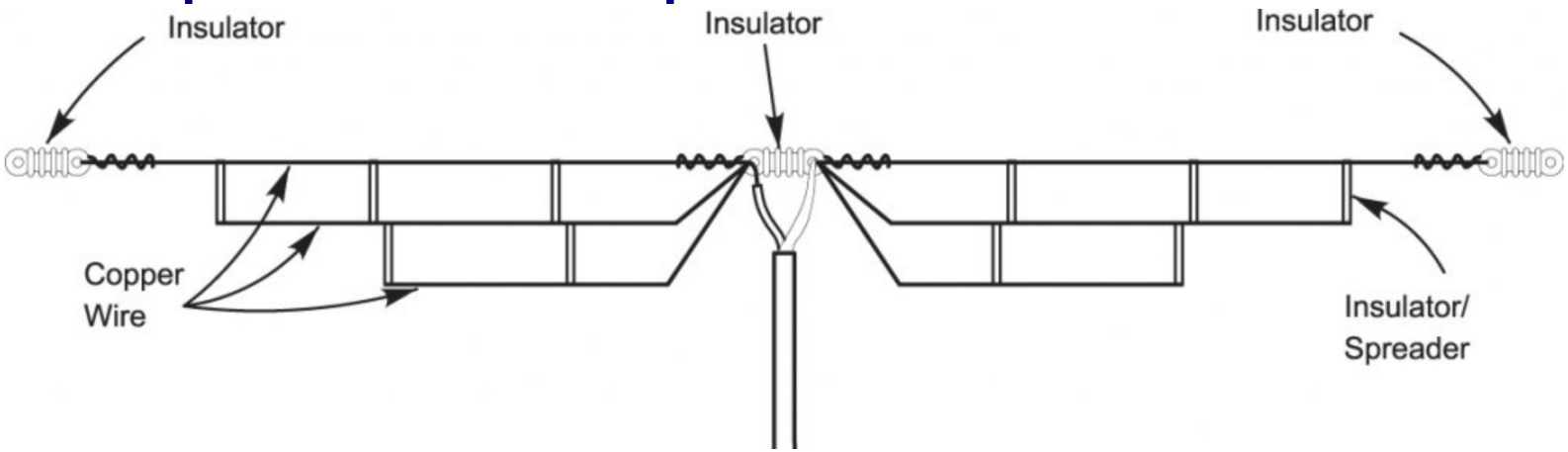


- Trap dipole for multiple bands

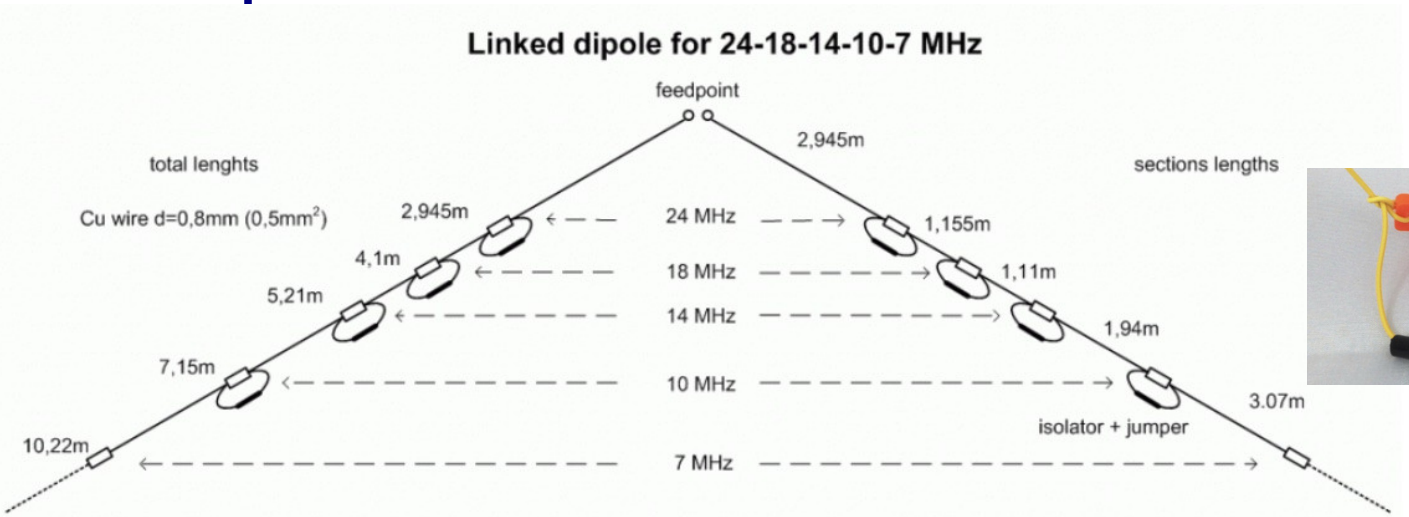


Dipoles

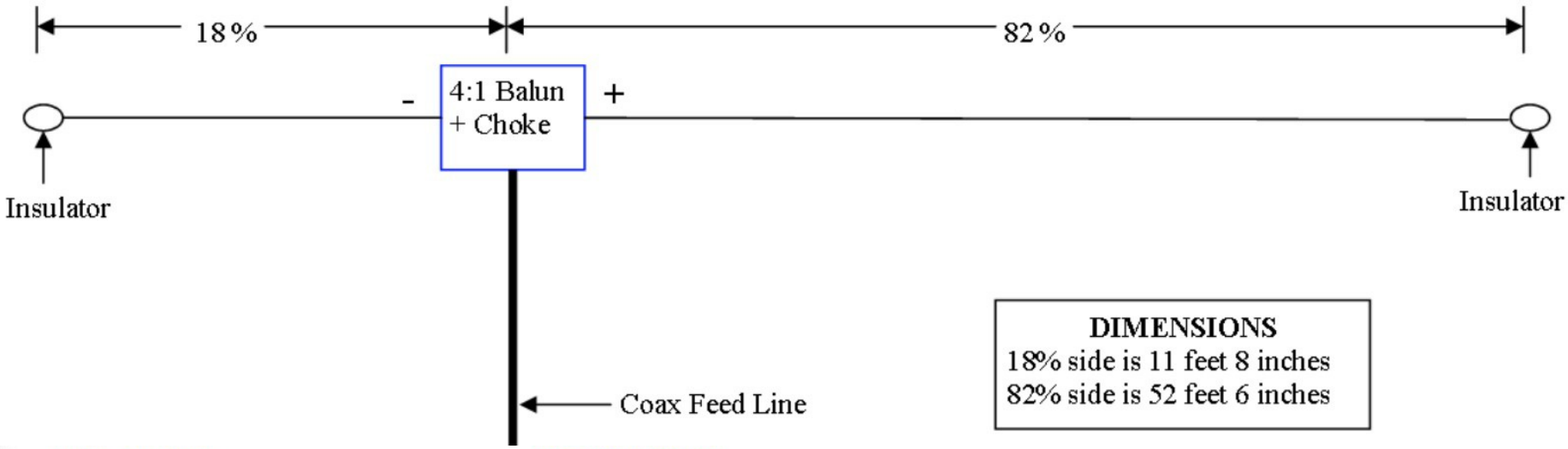
- Fan dipole for multiple bands



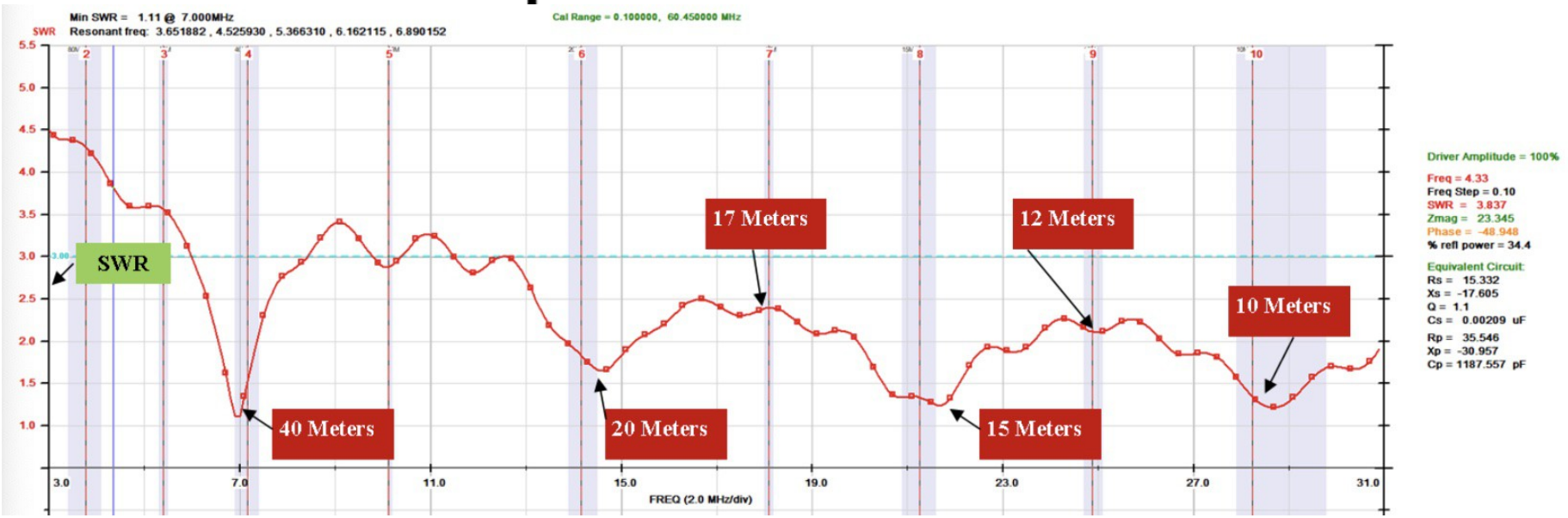
- Linked Dipole



Off Center Fed (OCF) Dipole



DIMENSIONS
18% side is 11 feet 8 inches
82% side is 52 feet 6 inches



Off Center Fed (OCF) Dipole

- One long and one short leg
- Hang center at about 35 feet
- Ends at 15-20 feet
- > 45 degrees between feed line and antenna elements (120-180° between elements)

End Fed OCF

Bullet™ End Fed OCF Antenna Configuration

Bands: 40-30-20-17-15-12-10-6

Coax feed line length > 25 feet

Feed Line Choke installed at 12 feet from matching unun—coax radiates to choke position!

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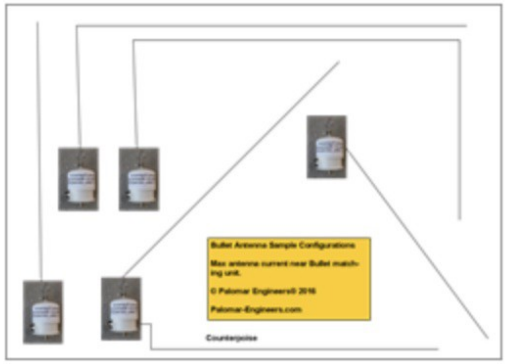
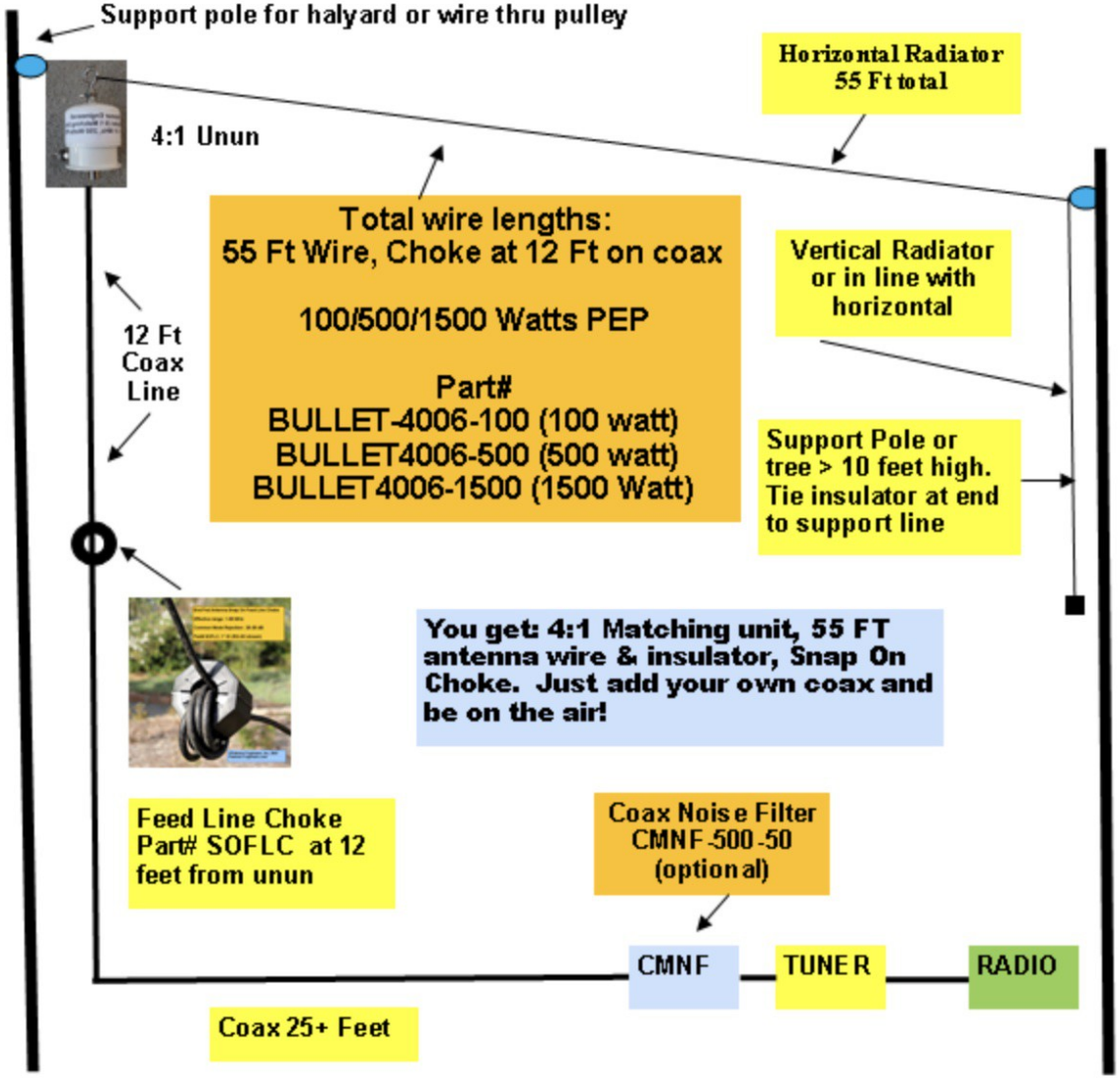
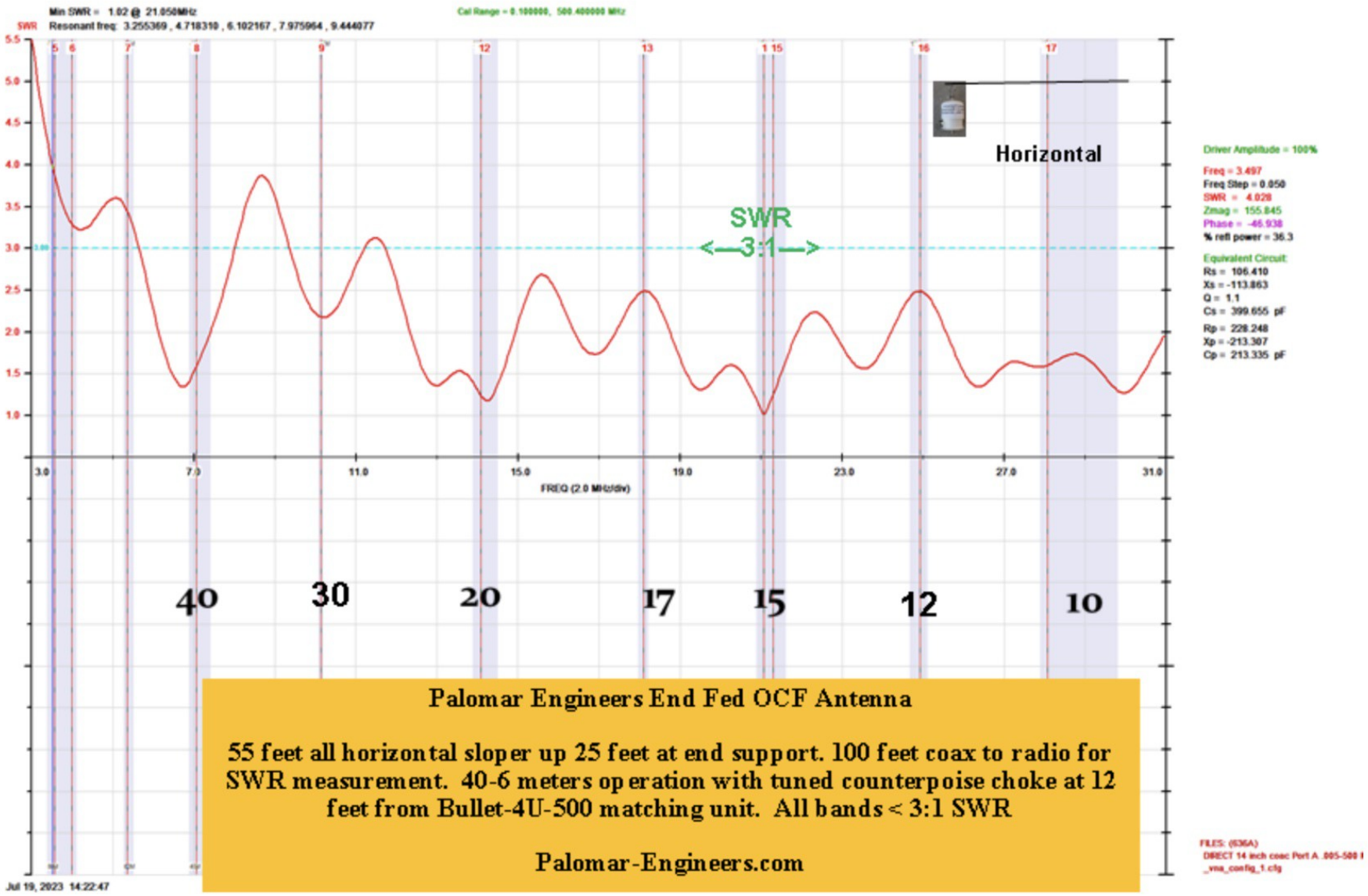
Other Possible Configurations





Great for portable operations—works on telescoping fiberglass pole—Sloper or inverted L

End Fed OCF



Palomar Engineers End Fed OCF Antenna

55 feet all horizontal sloper up 25 feet at end support. 100 feet coax to radio for SWR measurement. 40-6 meters operation with tuned counterpoise choke at 12 feet from Bullet-4U-500 matching unit. All bands < 3:1 SWR

Palomar-Engineers.com

Dipoles

- Easy to get in the air
  - Hang center from a tree or mast (Inv V)
  - Hang between two trees (flat top)
- Generally, the higher the better
- Slightly directional
- No radials needed

Buddipole Antenna System

- 10 meters

Standard 5.5 foot whips (2 arms)

Red whip: 5 sections (56 inches)
Red side: two arms
Black whip: 5 sections (56 inches)
Black side: two arms

With 9.5 foot whips

Red whip: 5 sections (100 inches)
Black whip: 5 sections (100 inches)

- 15 meters

Standard 5.5 foot whips

Red whip: 6 sections (all out)
Red coil: tap 4 (red)
Black whip: 6 sections (all out)
Black coil: tap 6 (black)

With 9.5 foot whips

Red whip: 9 feet (all but 6 inches)
Black whip: 9 feet (all but 6 inches)

Buddipole Antenna System

- 20 meters

Standard 5.5 foot whips

Red whip: 4.5 sections (56 inches)
Red coil: tap 10 (green)
Black whip: 6 sections (all out)
Black coil: tap 15 (blue)

With 9.5 foot whips

Red whip: 6 sections (all out)
Red coil: tap 7
Black whip: 6 sections (all out)
Black coil: tap 8

- 40 meters

Standard 5.5 foot whips (2 arms) with coils

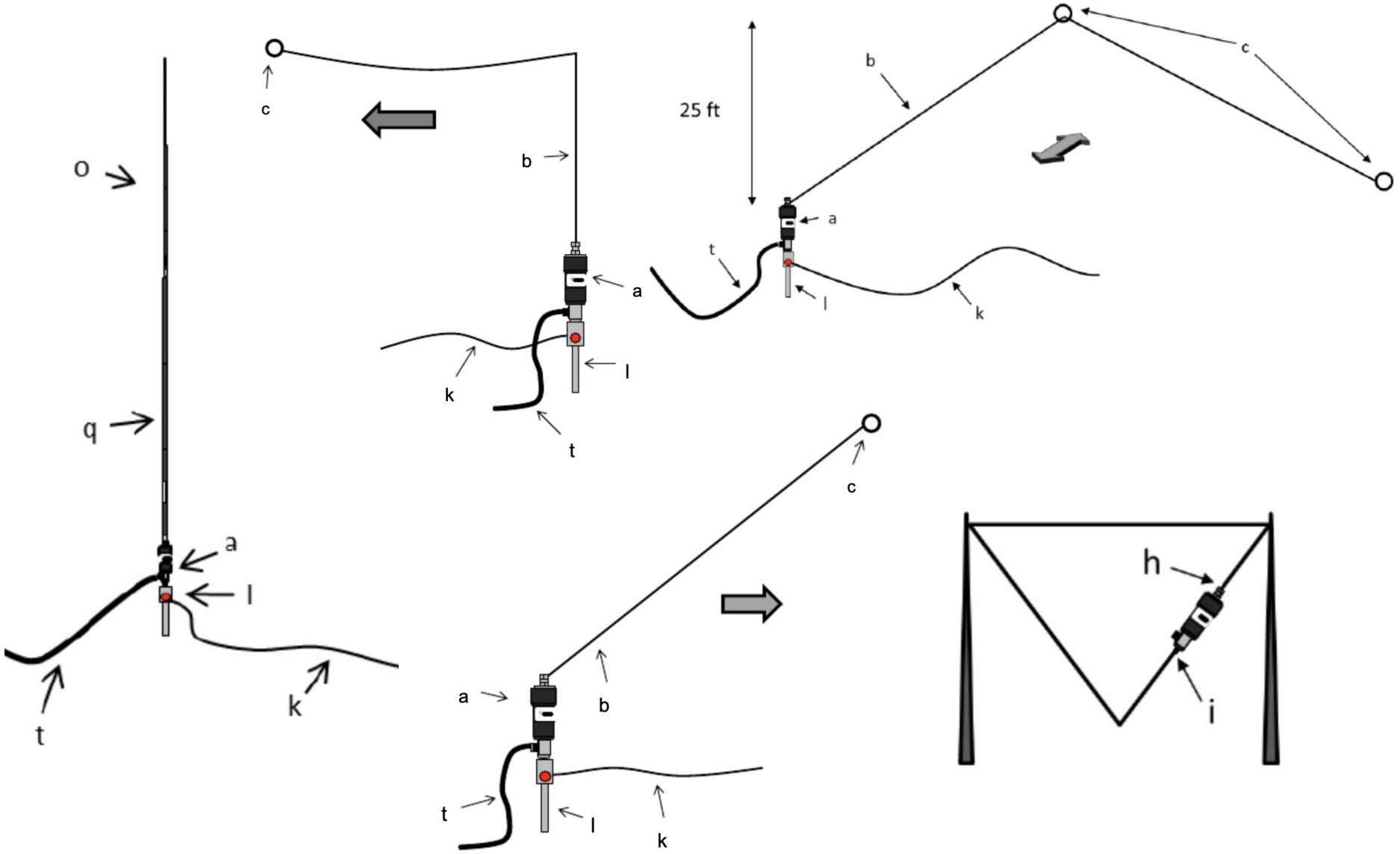
Red whip: 6 sections (all out)
Red coil: tap *none*
Black whip: 6 sections (all out)
Black coil: tap *none*

9.5 foot whips (2 arms) with coils

Red whip: 6 sections (all out)
Red coil: tap 25
Black whip: 6 sections (all out)
Black coil: tap 24

Buddipole Antenna System

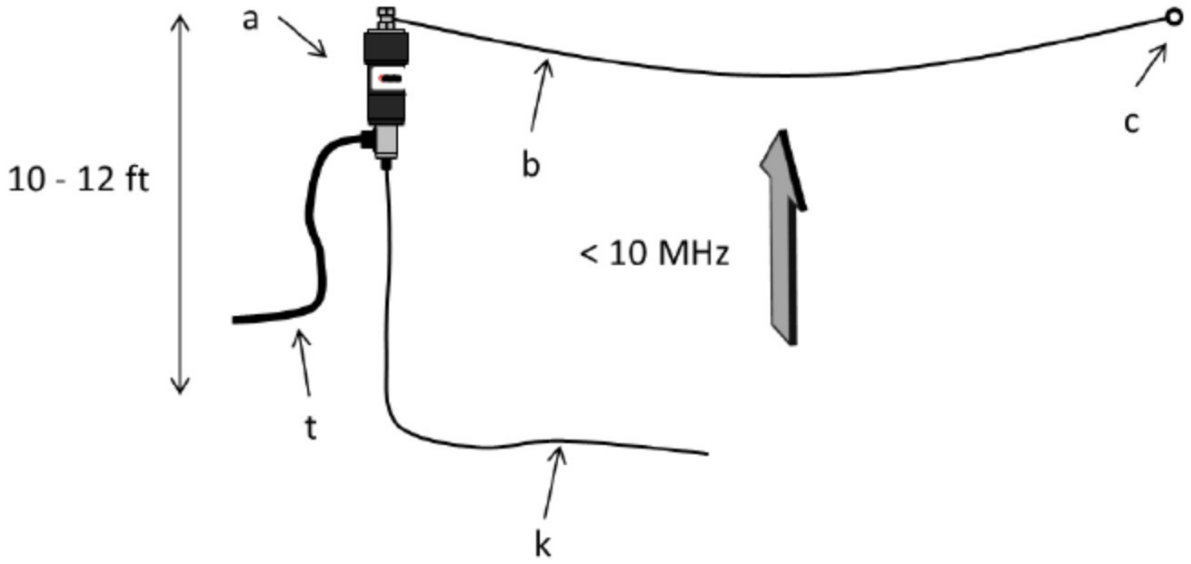
Chameleon MPAS 2.0



NVIS (Near Vertical Incidence Skywave)

Used to make close contacts (?? miles)

- Buddipole 17 foot push up mast
  - Not really high enough for a 40M dipole
  - It can be used for NVIS on 40M and 80
- Chameleon MPAS 2.0



Magnetic Loop

Magnetic Loop

- Multi-band
- Quiet receive
- Compact size
- Quick and easy setup
- No ground plane
- No tuner required
- Doesn't need to be high in the air
- Low power (20-25W)
- High-Q Antenna
- Fairly expensive

Other Considerations

- Rated power and duty cycle
  - WRC Silver Bullet 1000 and Mini

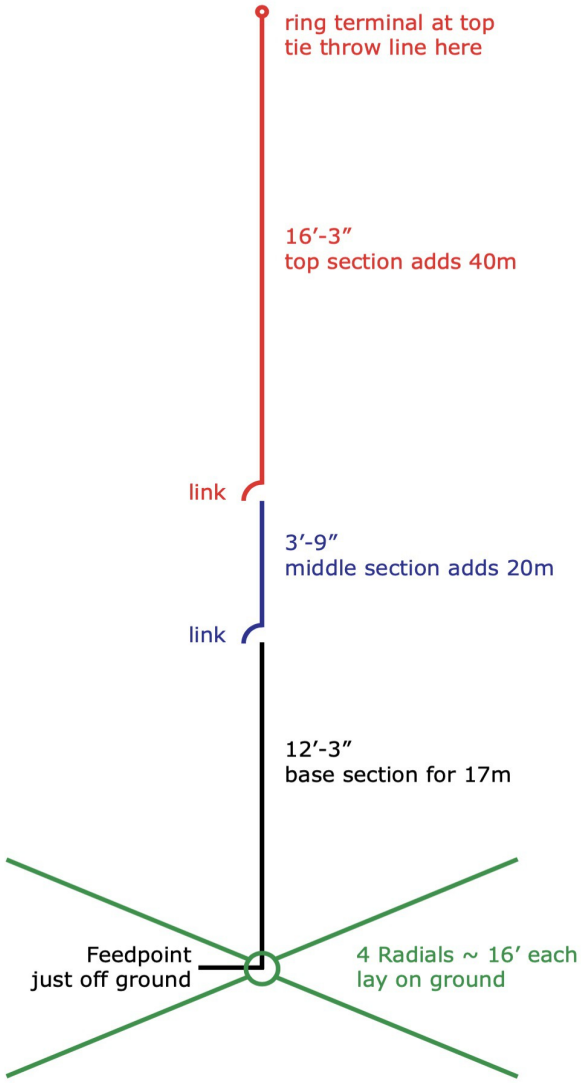
    100 W SSB / 50 W CW / 20 W Digital
  - Alpha 100 W Magnetic Loop

    100 W SSB / 50 W CW / 25 W Digital
- Antenna Analyzer or VNA
- Perfect vs. good enough

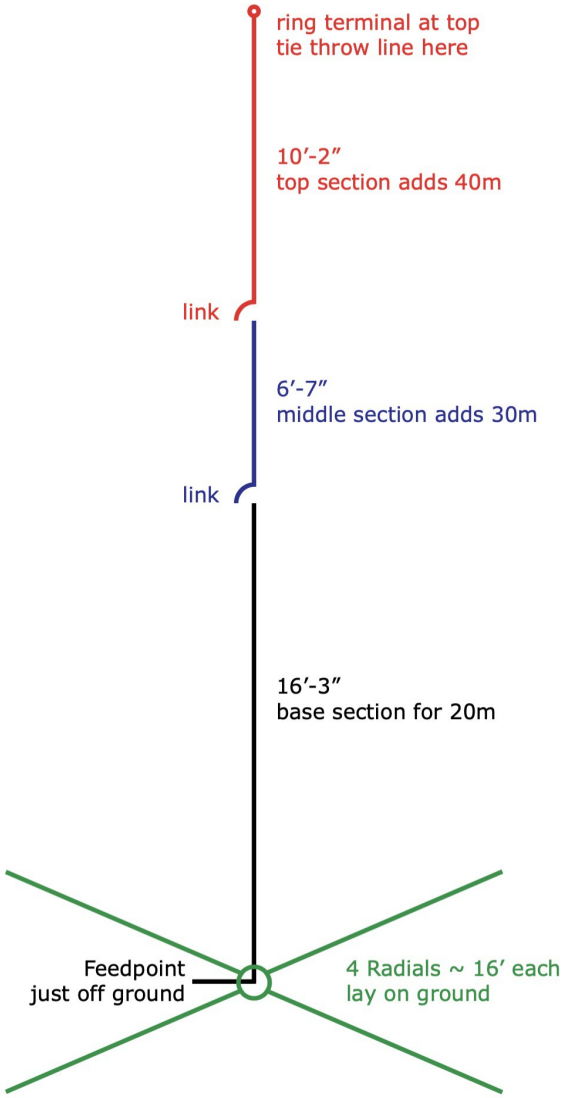
Build Your Own

- Linked dipole (kits available)
- Trap dipole (kits available)
- Fan Vertical (DX Commander)
- Linked vertical
- Tent pole vertical

Build a Linked Vertical



40/20/17m SSB Linked Vertical

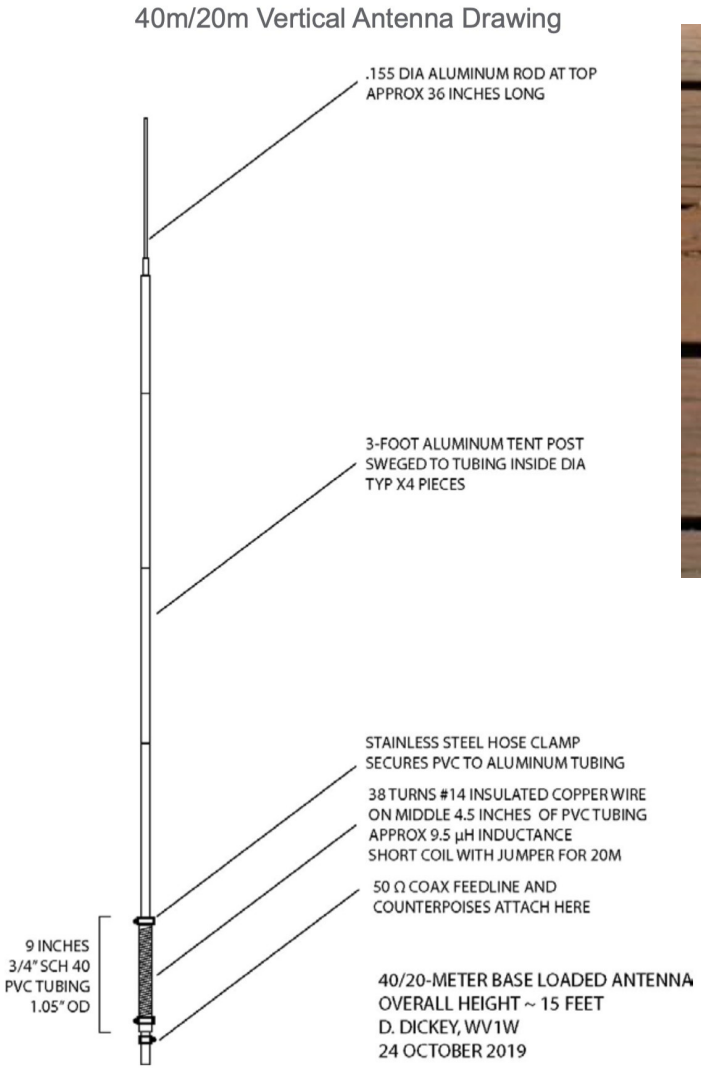


40/30/20m CW & Digital Linked Vertical

Notes for Wire Antennas

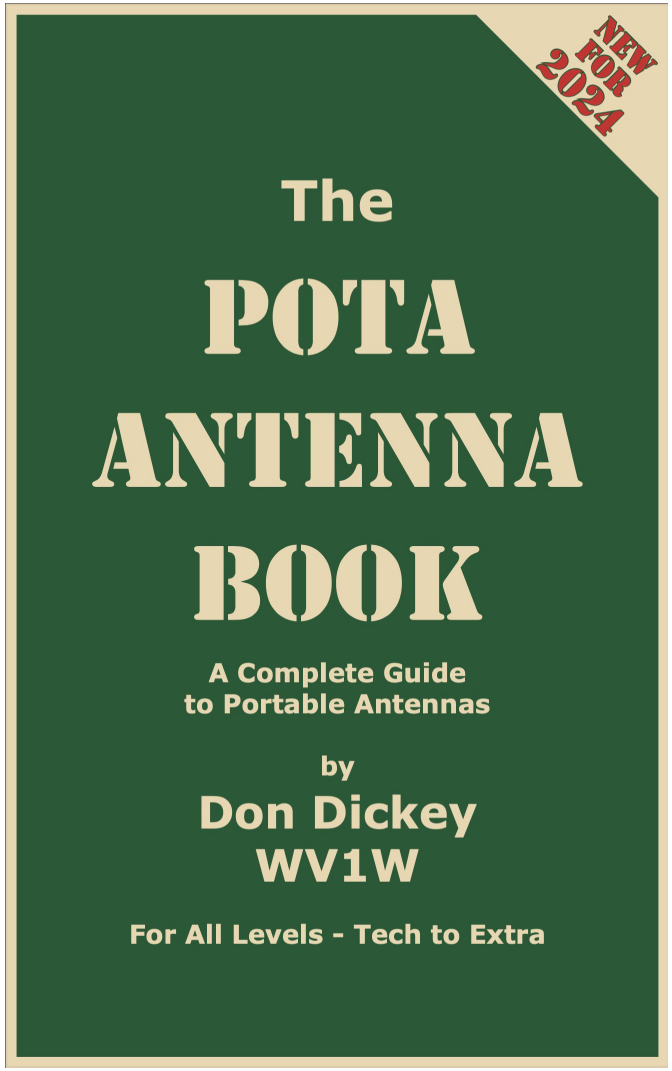
- Use a multi-strand wire to limit “memory”
  - 18 gauge – 17 strands
- A banana plug fits an SO-239 connector

Build a Tent Pole Vertical



TIP: Don't buy anodized aluminum tent poles from Amazon or REI and expect them to work well as an antenna because they will not have electrical continuity end-to-end.

Reference



Available at:
https://wv1w.us/antenna_book.html

PDF: $7.49 Paperback: $14.99