

John's broken antenna

Connection Problems

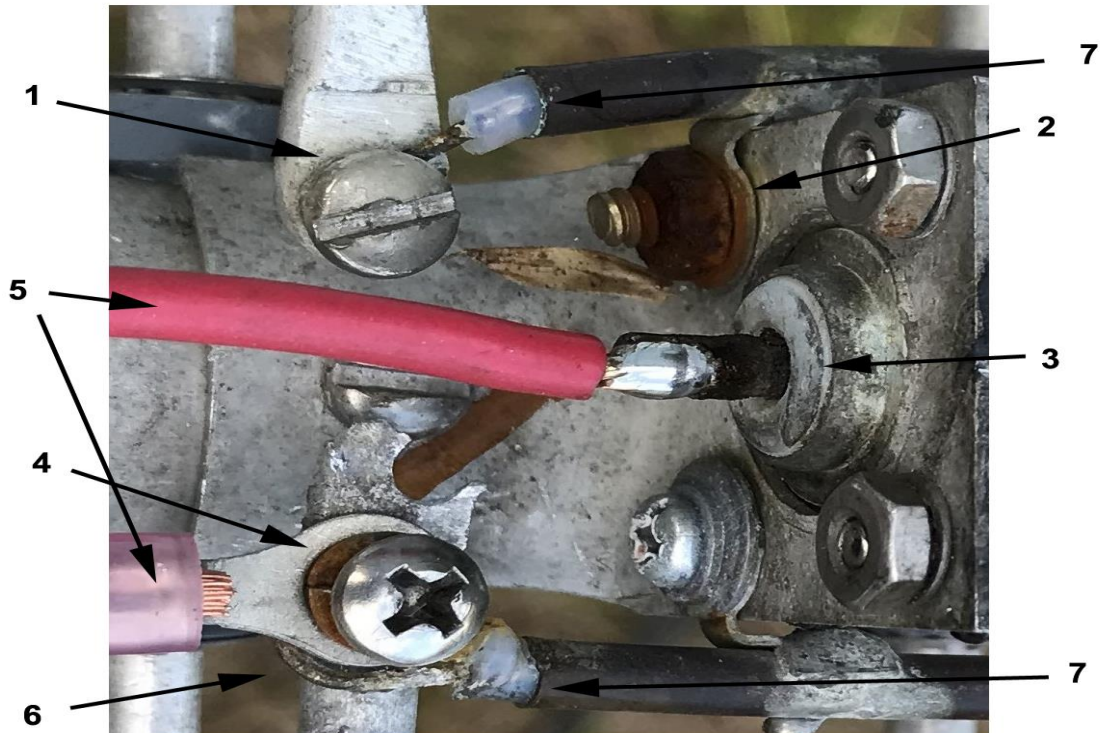


Figure 1 Multiple wiring and hardware errors

- 1.) Wires under screws with no lug or proper flat washers to sandwich
- 2.) Rusted critical hardware and both lugs technically go the wrong direction. Ideally grounds should be at the coax ends
- 3.) No weatherproofing, often will leak
- 4.) Wrong hardware and rusted hardware
- 5.) Wire crimped and far too long. Outdoor wire connections should be soldered or clamped, not crimp lugs
- 6.) Wire under the wrong hardware
- 7.) No water leak sealing or protection

Adjustment Errors, very poor symmetry

T-match should be kept symmetrical to centerline

D1 = D2

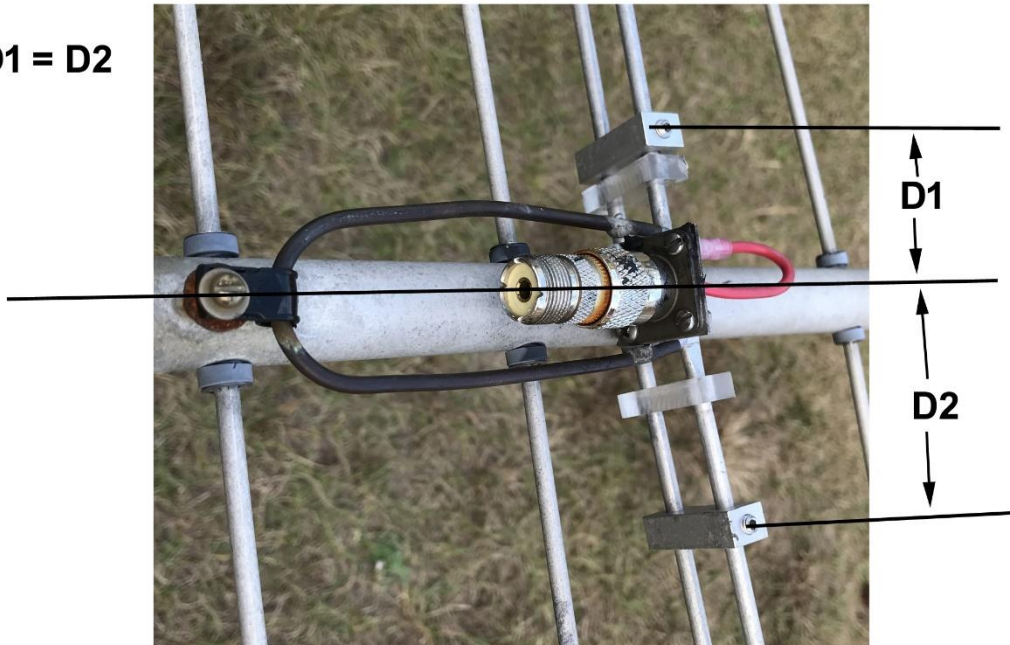


Figure 2 Symmetry error

1. D1 and D2 are not equal
2. Multiple other connection problems

Errors Overview

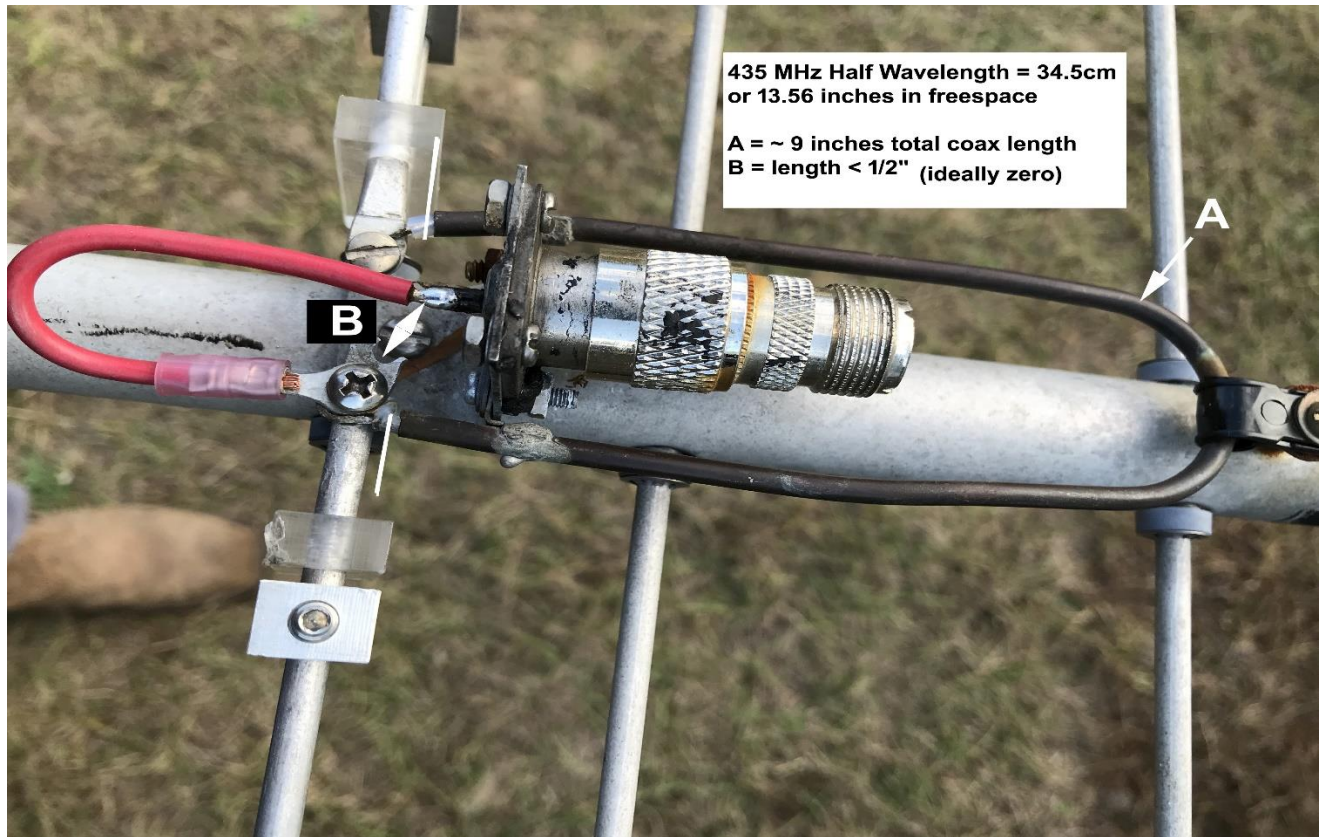


Figure 3 Wiring

A should be $\frac{1}{2}$ wavelength of a fairly low-loss reliable coaxial cable. The ideal cable impedance is 100-ohm, since each half of the T should look like 100-ohms and have near zero reactance.

B should be as short, wide, and smooth as possible. Plated copper strip or flashing would be ideal, solid wire second best, stranded third best choice and braided last choice. B should be a tiny fraction of a wavelength. Even one inch is too much at 432 MHz. Just one inch of connection length at 432 is like using 110 inches of connection length on 75 meters!!!

The higher the frequency the shorter connections must be.

How a "T-match" works

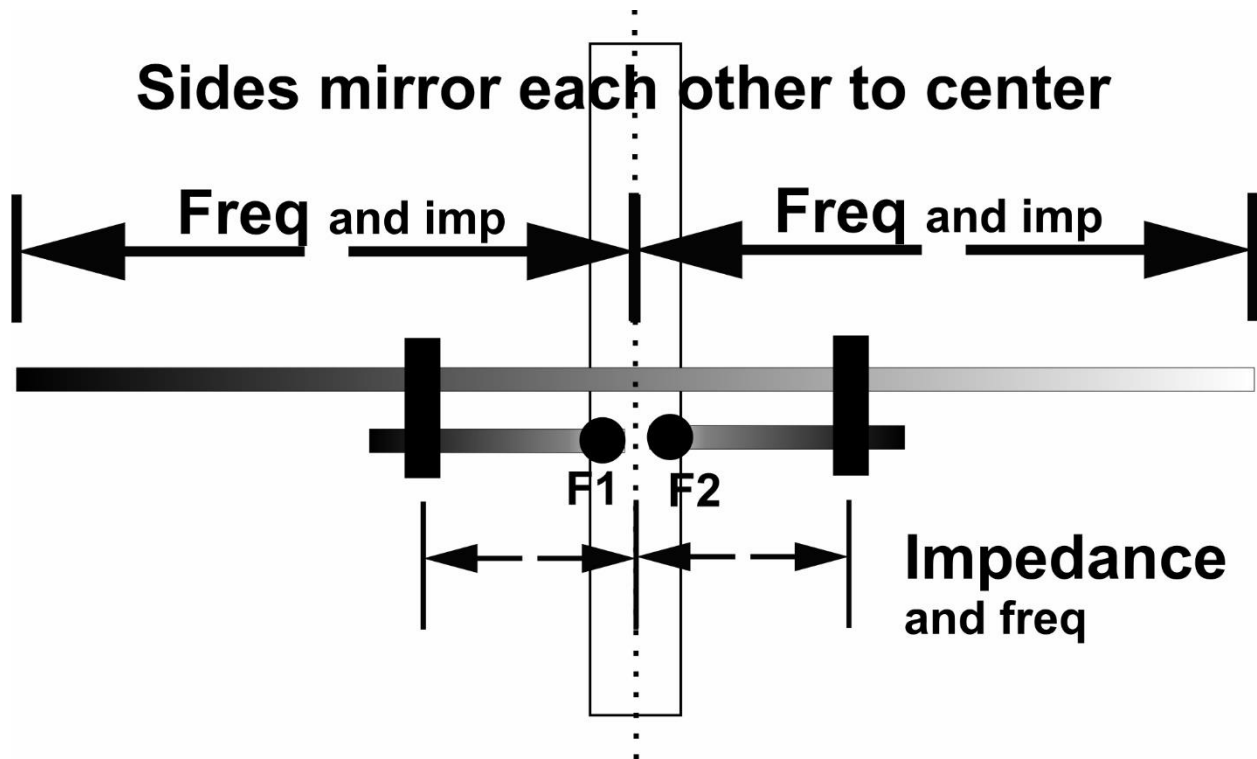


Figure 4 T-match simple operation rules

Everything must be symmetrical to the boom centerline. The **element length** primarily determines the resonant frequency (reactance) and secondarily determines the impedance.

The T tap-sliders primarily adjust the impedance (SWR) and secondarily affect the resonant frequency.

Adjustment is back and forth with element length and T-match sliders, but must be symmetrical

Finished better (but not quite right) Antenna Feed point

The feed point was cleaned up a great deal and will probably “work”



Figure 5 lower assembly errors

1. Needs sealed copper strip would have been better
2. Should have two stainless passivated washers, dielectric compound, and tension washers. Needs to be weatherproofed better with liberal use of dielectric compound

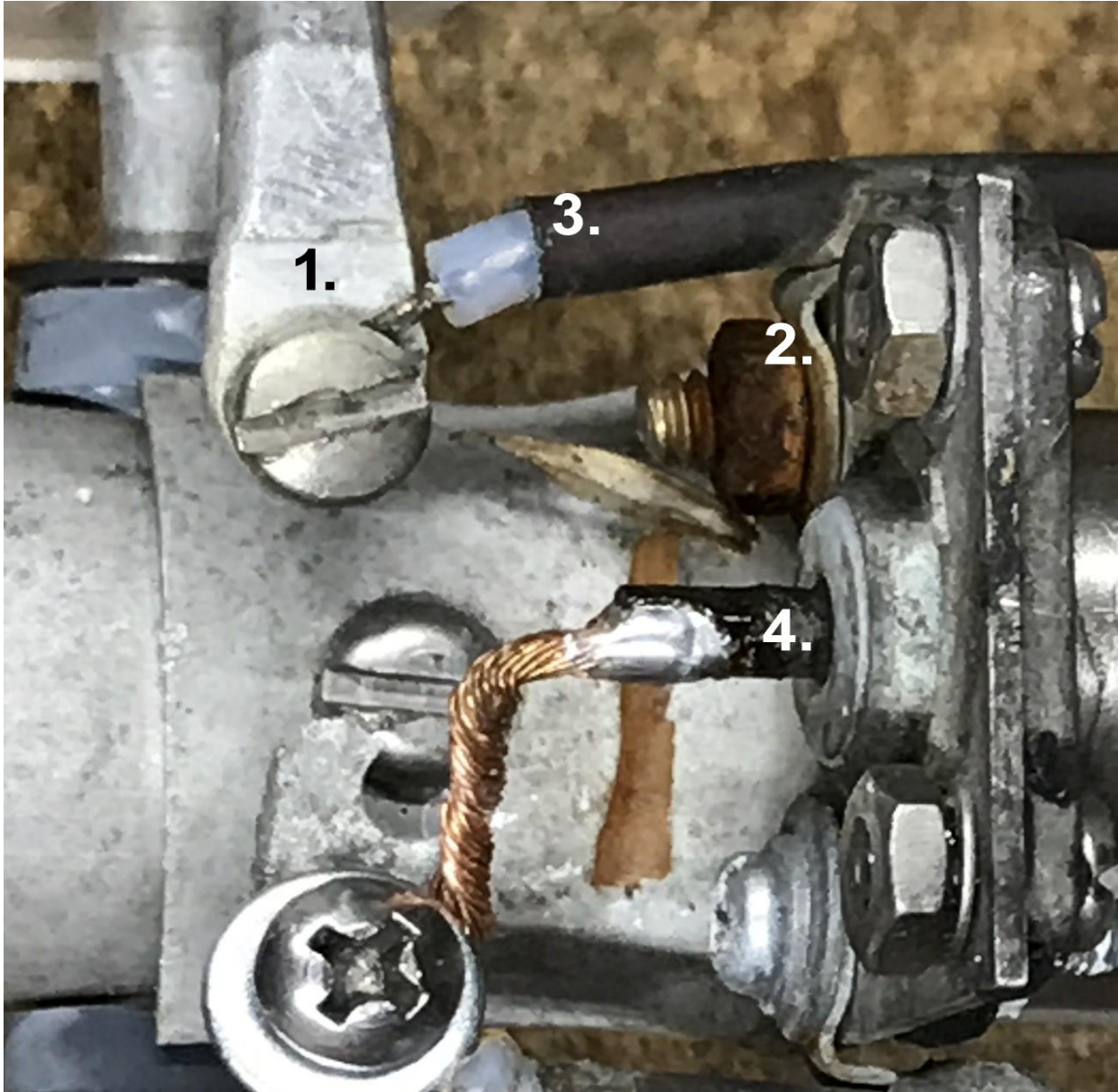


Figure 6 upper assembly errors

1. Needs new proper hardware. The wire should be between passivated stainless flat washers
2. Rusty zinc-steel hardware must be replaced with passivated stainless
3. Must be sealed
4. Must be sealed and the wire really should have been solid copper or better a wide, flat, plated or tinned copper strip