The Difference Between Loading Coils and Traps, Also Self-Resonant Traps

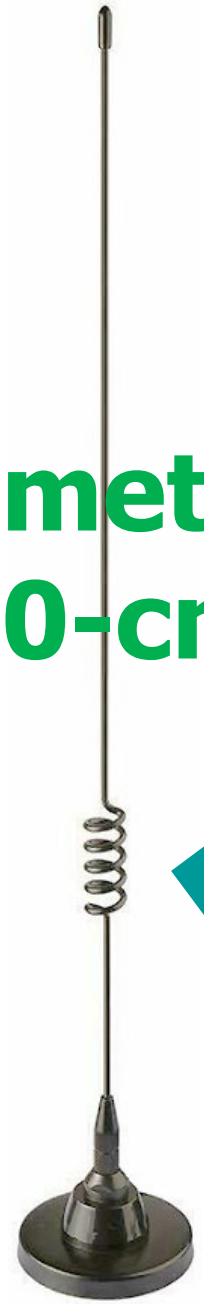
The Great Train Loading Coil Mystery

1978: Sean Connery. Donald Sutherland, Lesley-Anne Down


Traps & Loading Coils
Differences / Similarities
Still Undiscovered
Country
w6nbc.com/slides.html

I did not fully understand

2-meter
70-cm



Loading Coil or a Trap

Loading Coils

Just a Plain Coil to add inductance to make a short antenna work on a lower frequency

A Full-size 32 ft. 1/4 wavelength whip

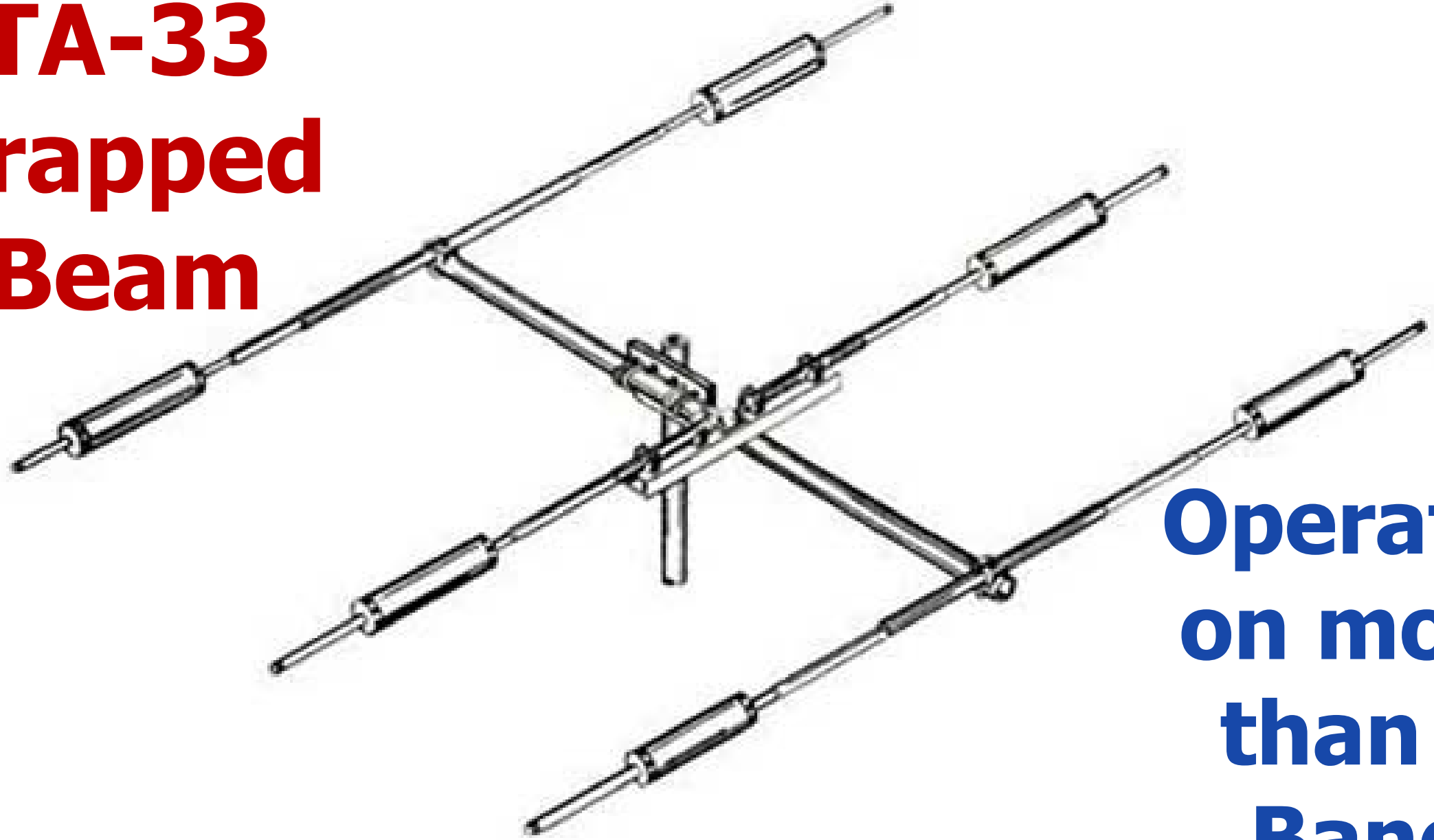
Important Single-Band Device

Loading Coil

Traps

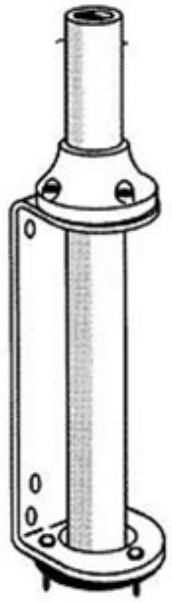
Trap

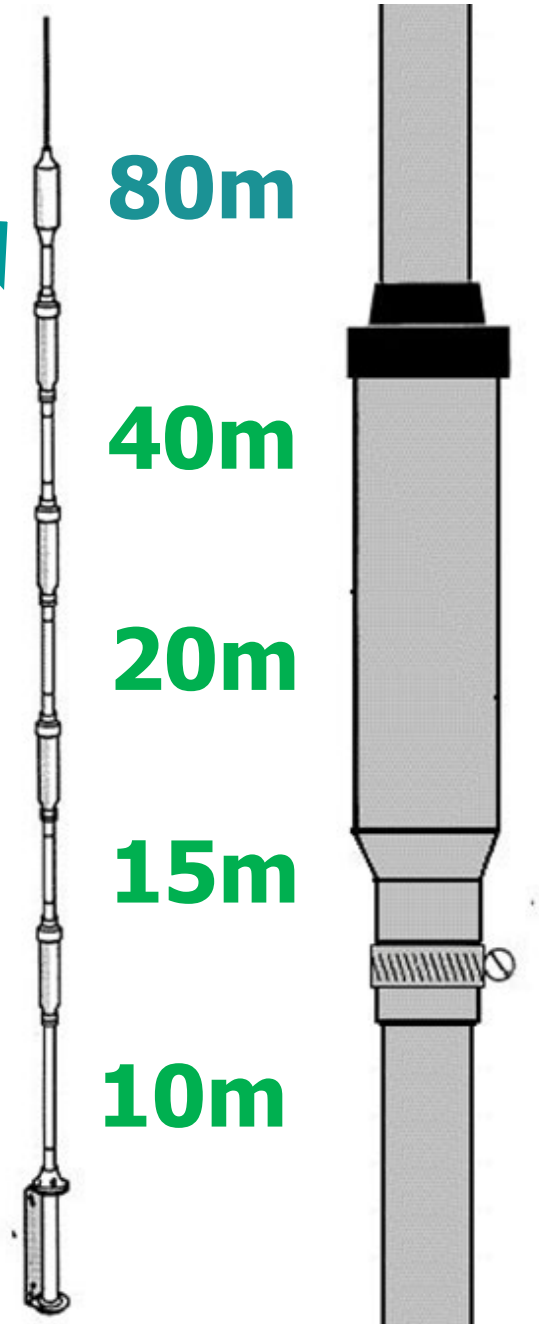
TA-33 Trapped Beam



Operates on more than 1 Band

Multi-Band Device





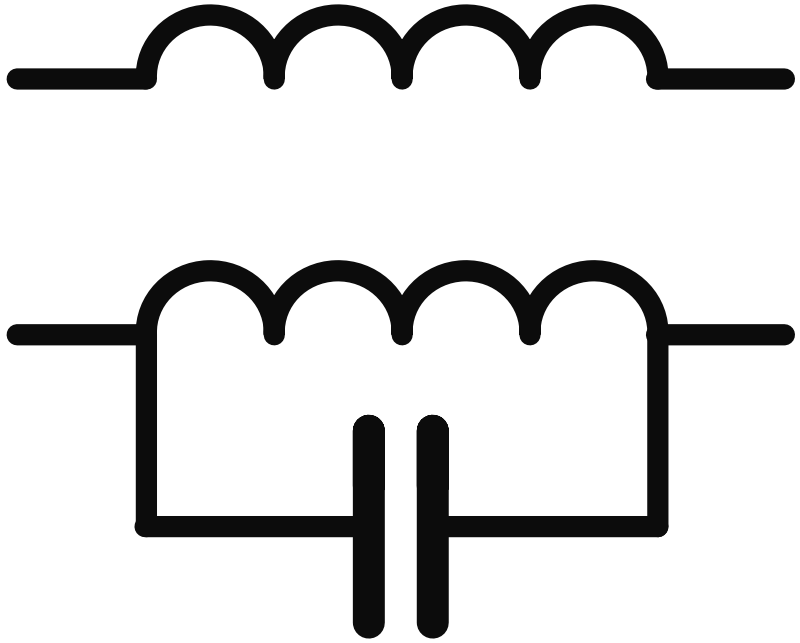
5BTV Hustler Multi-Band Trapped Vertical

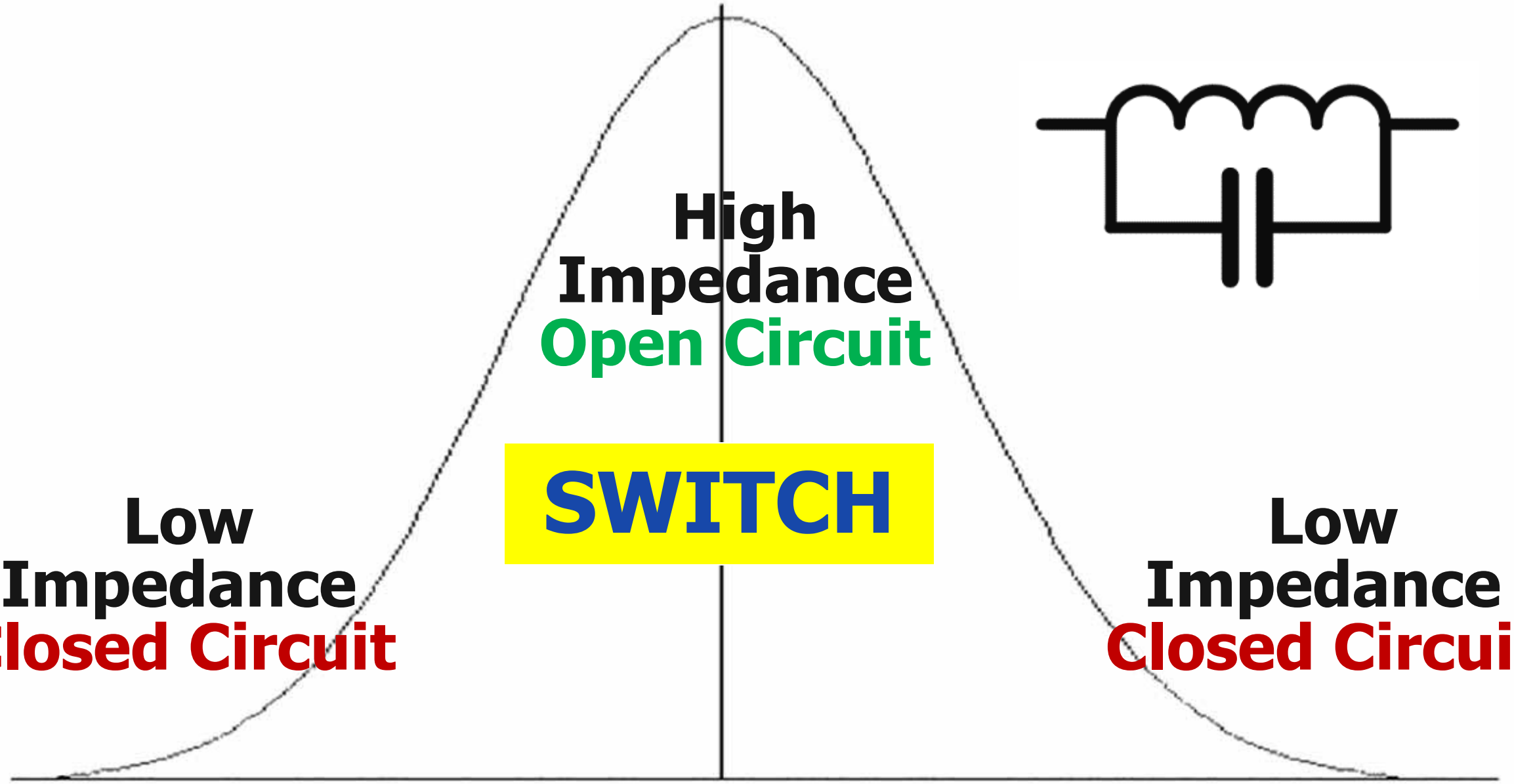
Electrically

A Tapping Coil

Is Just a Plain Coil

in Parallel with a Capacitor





Trap Resonant Frequency $f = 1/2\pi\sqrt{(LC)}$

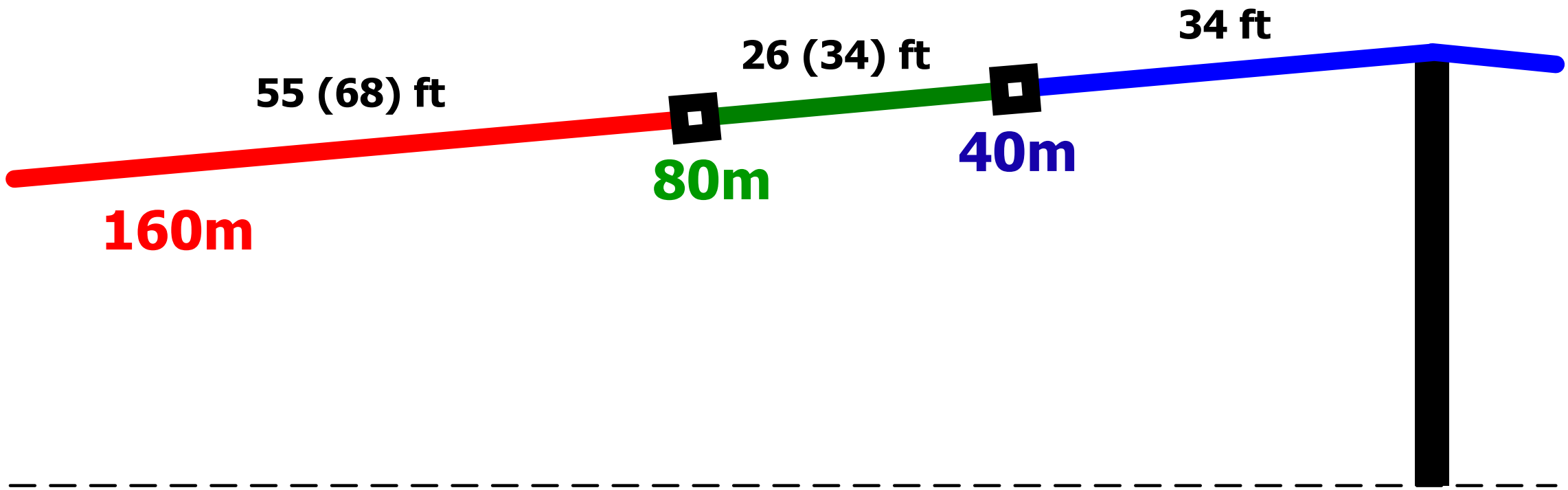
OPEN

Only the inner dipole works

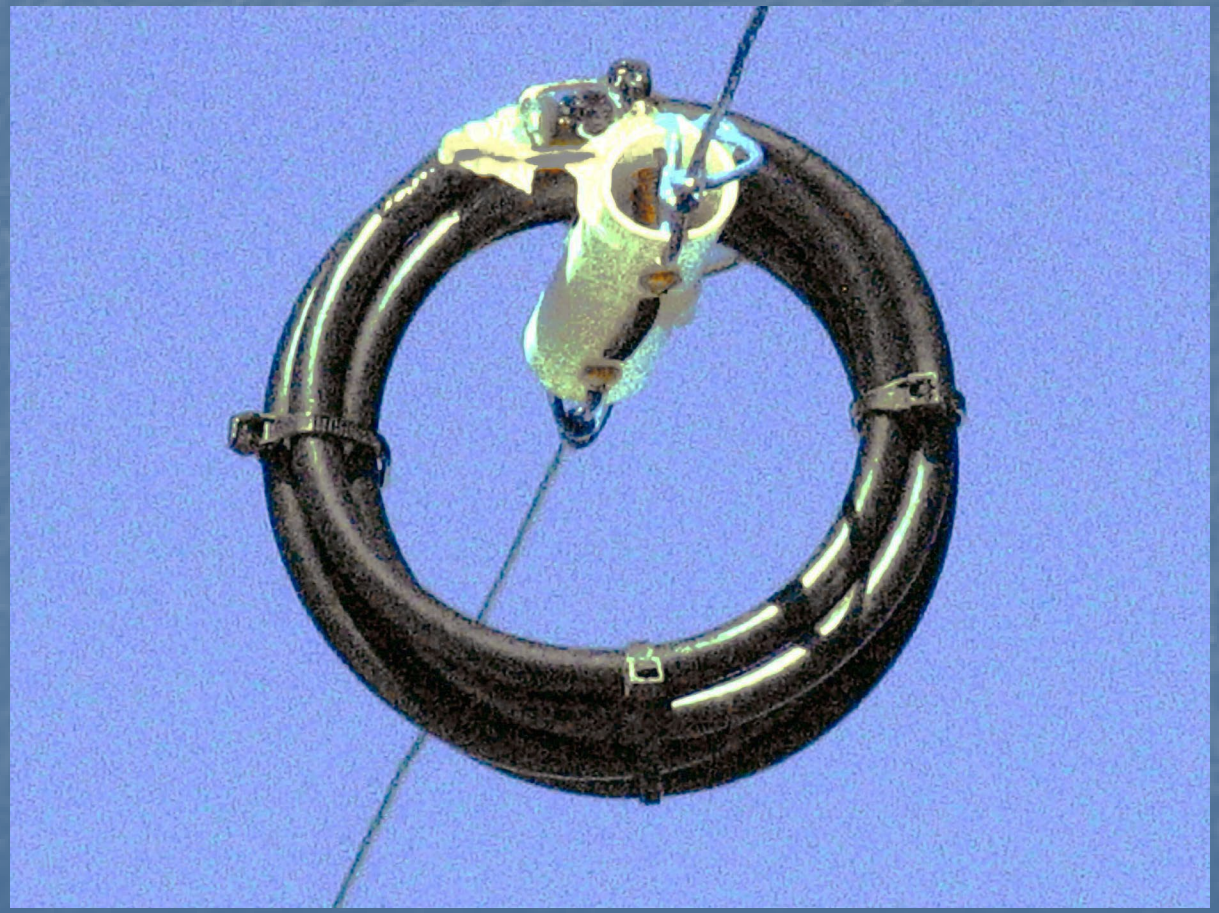
CLOSED

The whole dipole works

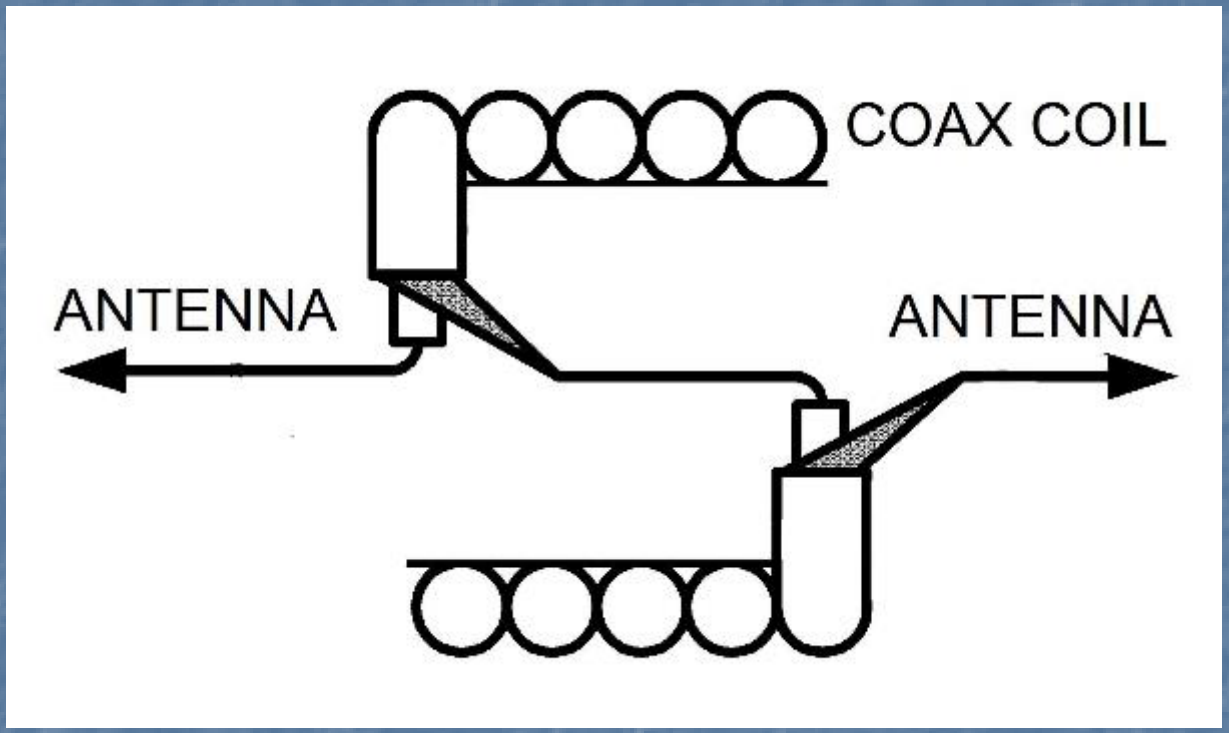
Tri-Band Inverted V



Traps Made of Coax

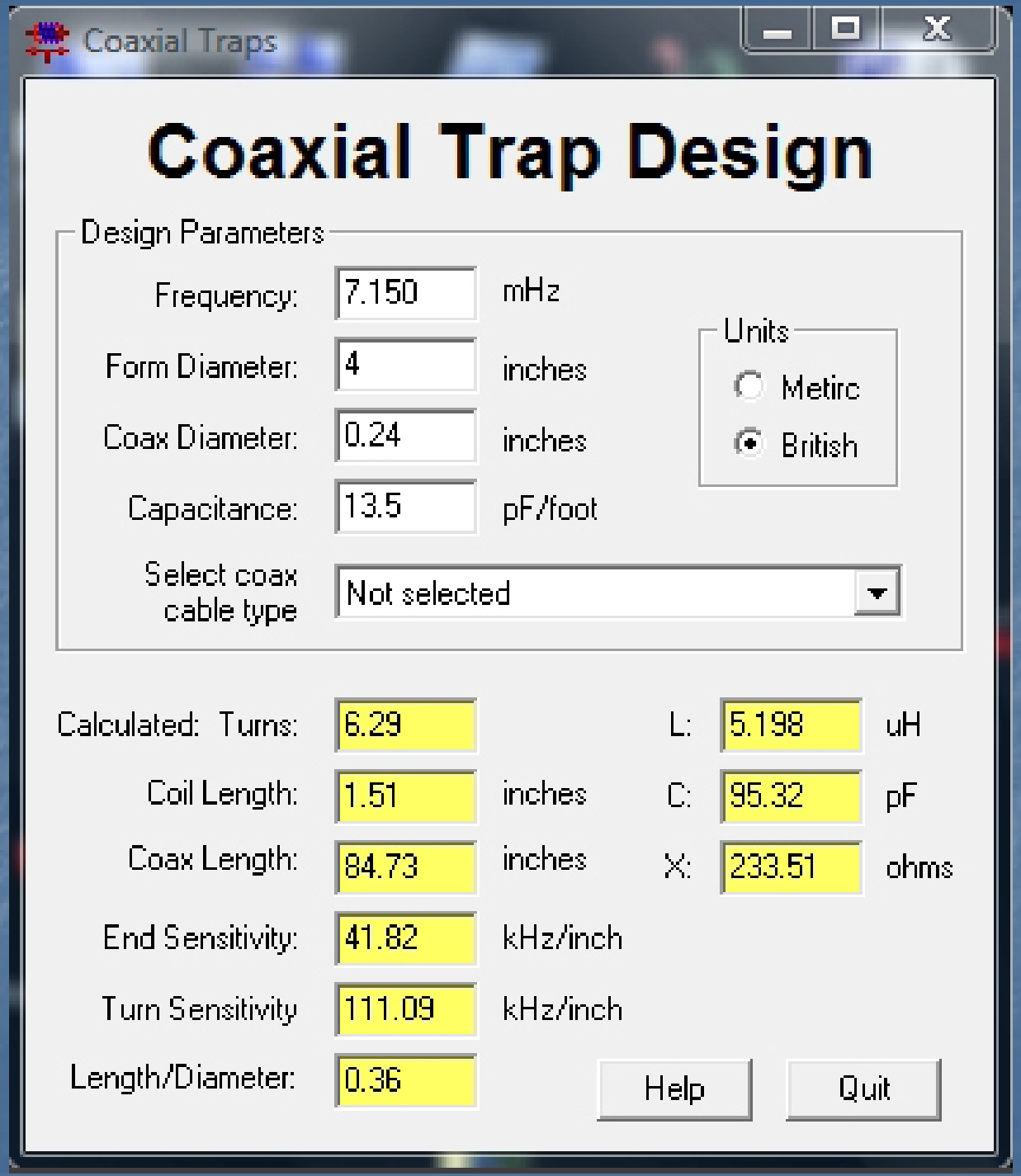


Parallel L & C From Coax



Outside of Coax is L
Inside of Coax is C In parallel

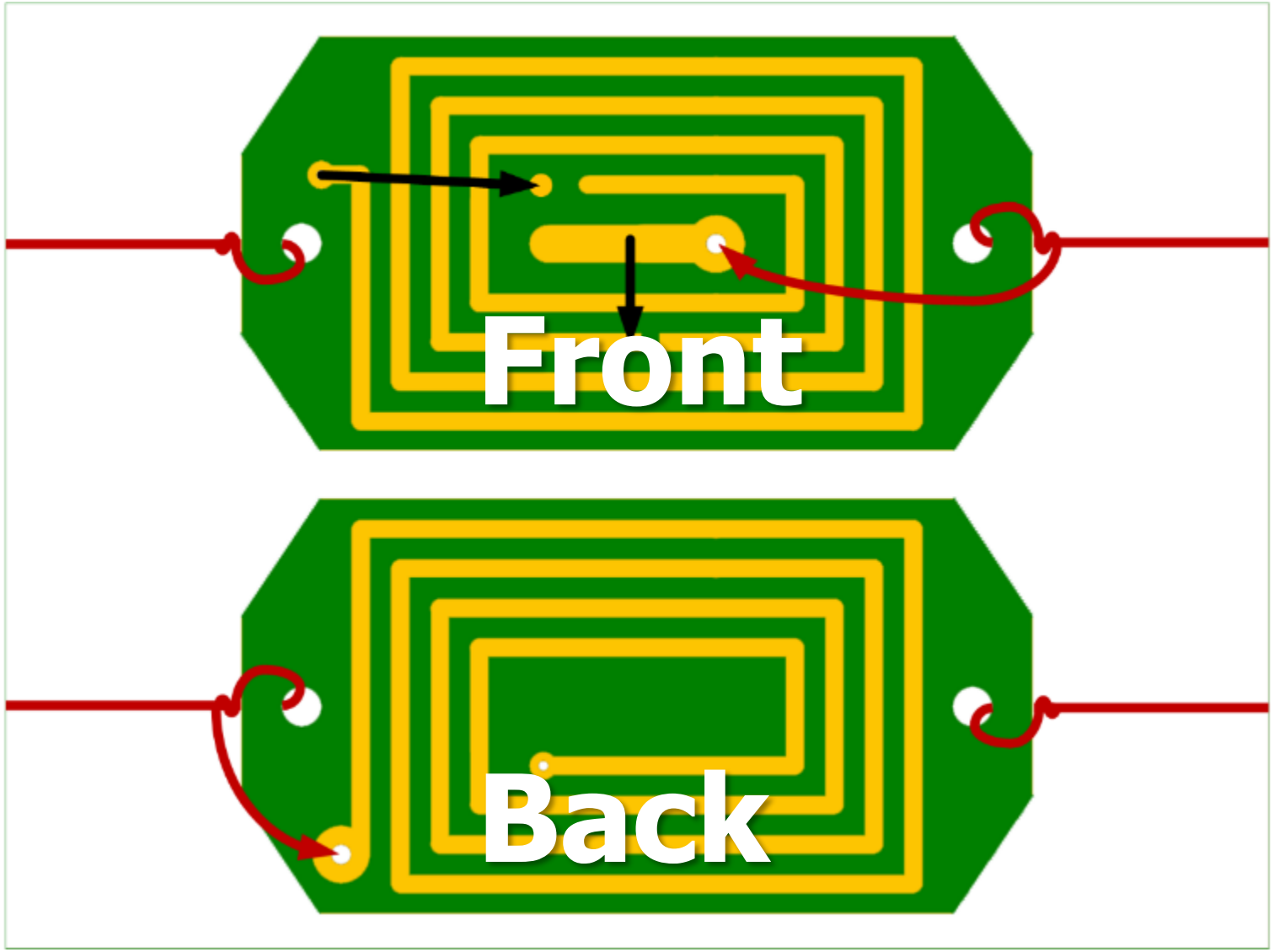
Scramble Wound Trap



Coaxtrap.zip

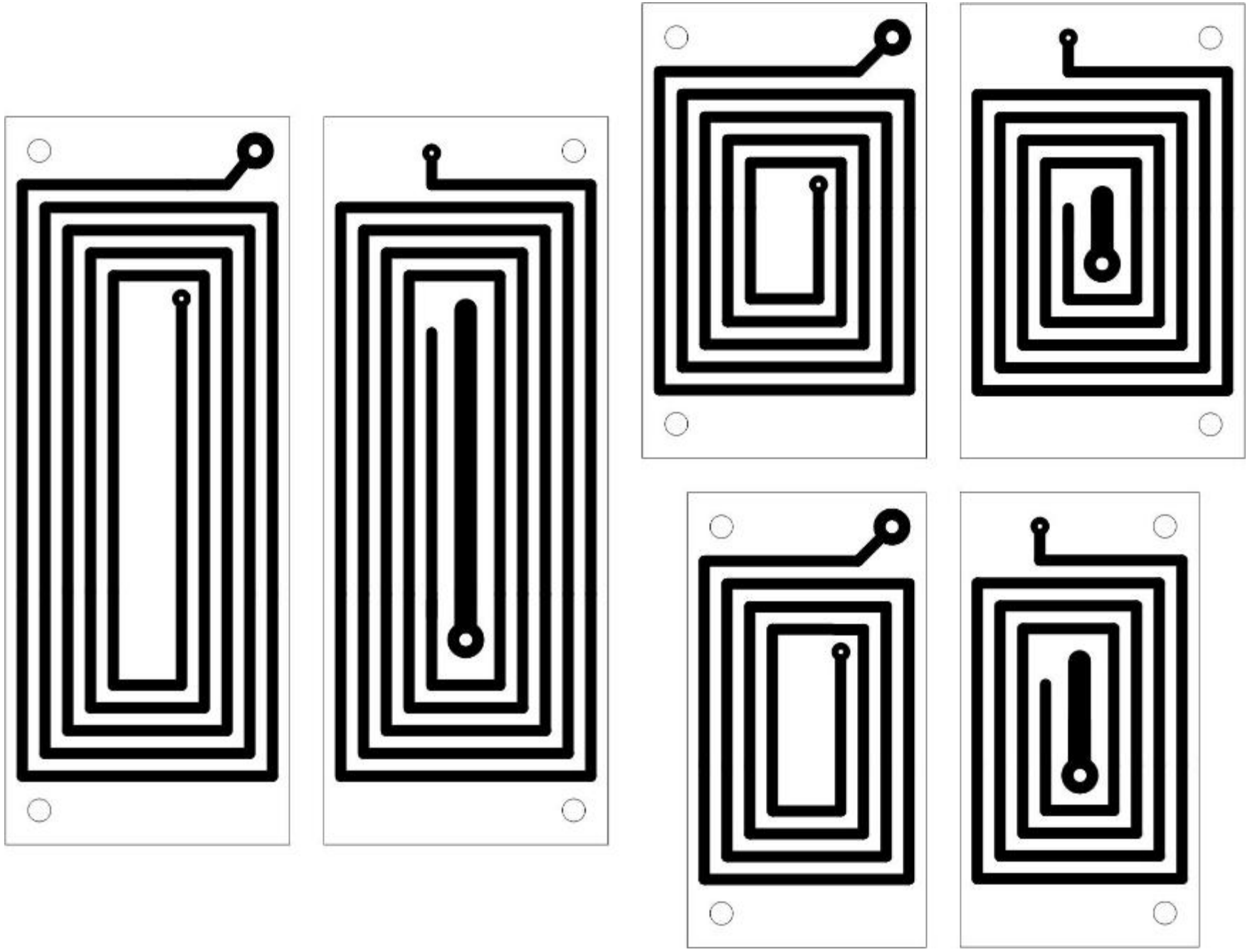
Trapqsl.net/ve6yp/

PCB TRAPS: L & C



Inductance:
PCB Coil(s)

Capitance:
Back-to-Back
PCB Stripline



PCB etching patterns

3 boards cover all HF bands down to 40m

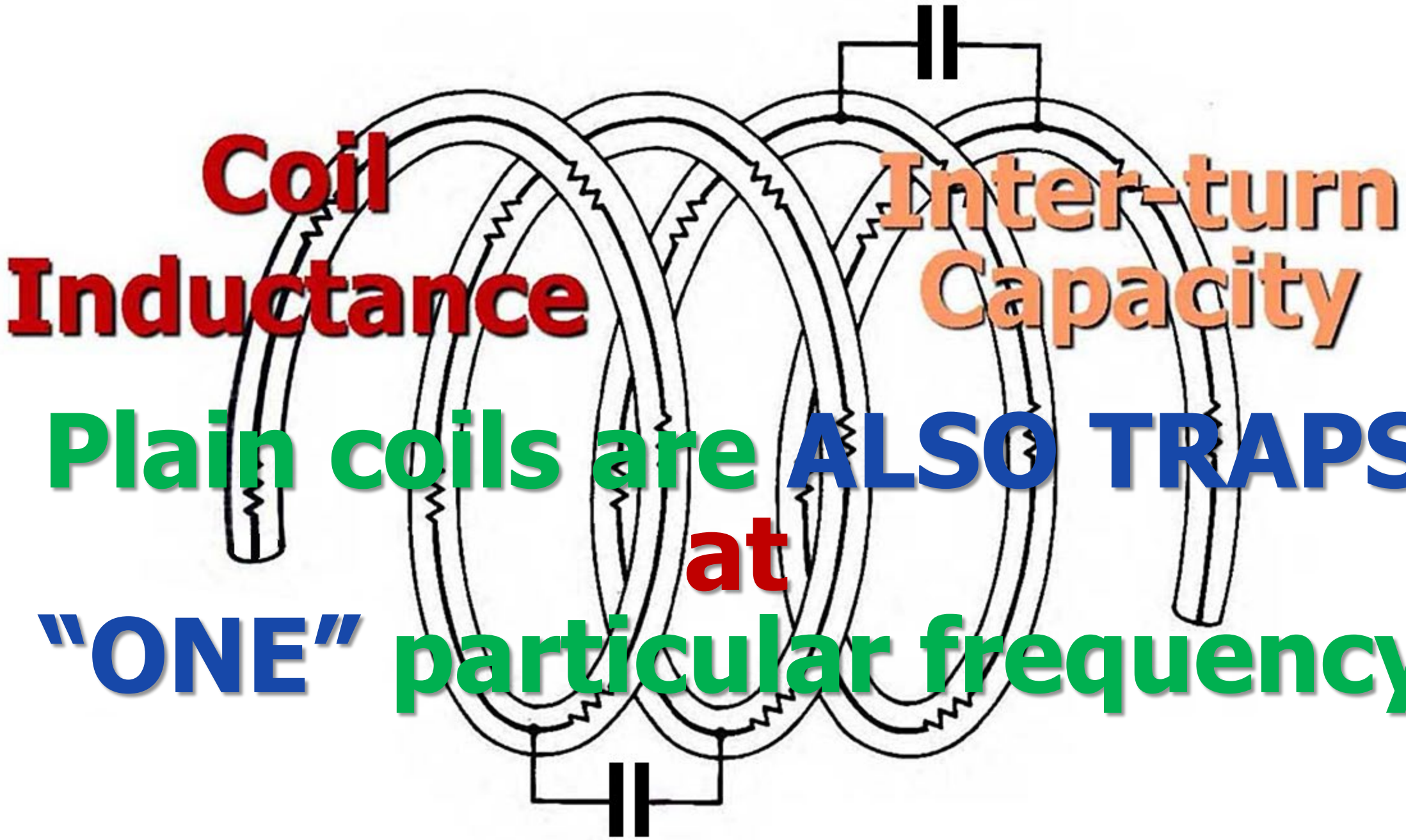
I thought that was all all I needed to know about traps

But still a Mystery

My 2m/70cm coil has to be a trap

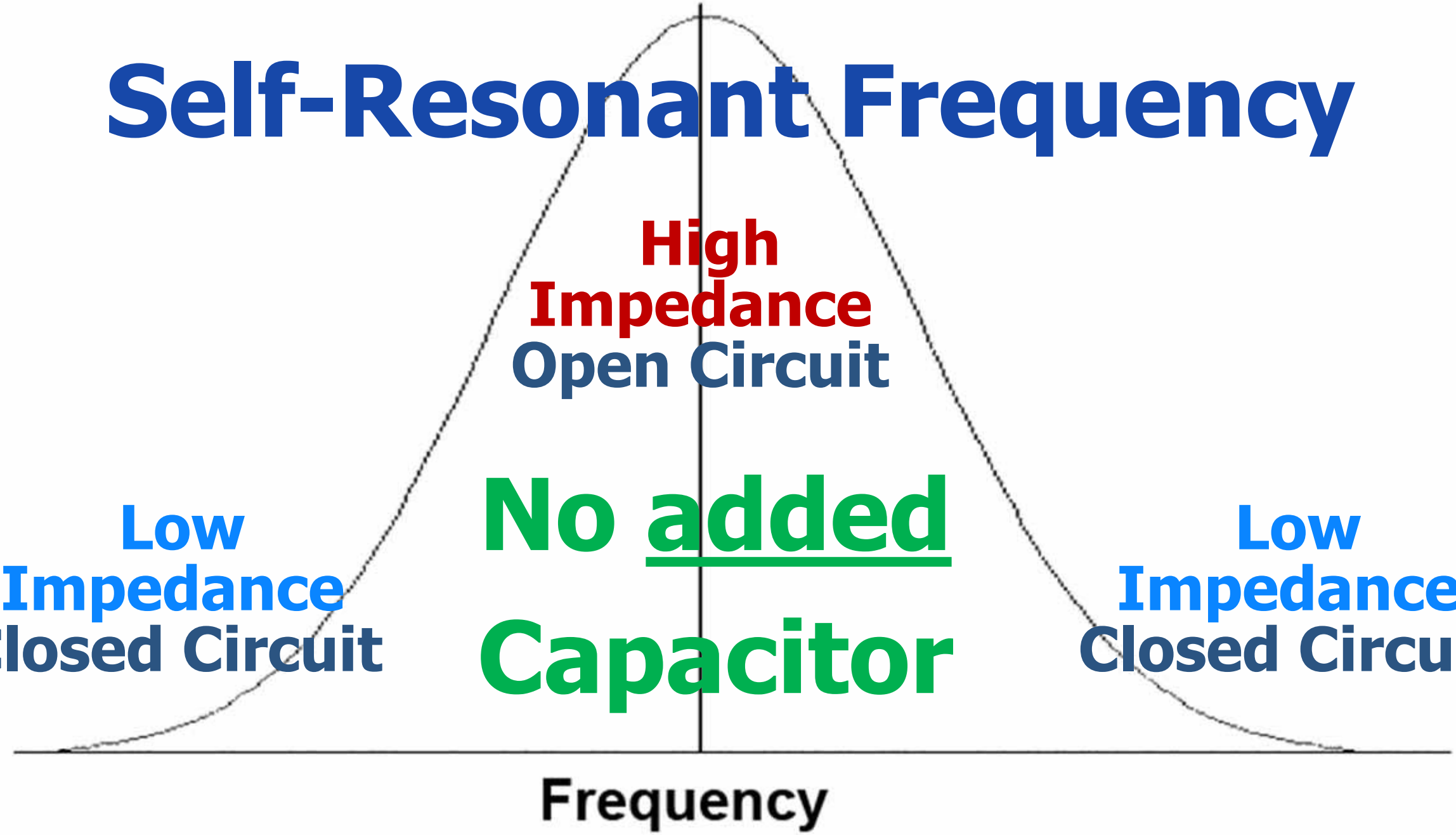
It works 2 Bands

But where's the capacitor?



Plain coils are ALSO TRAPS at "ONE" particular frequency

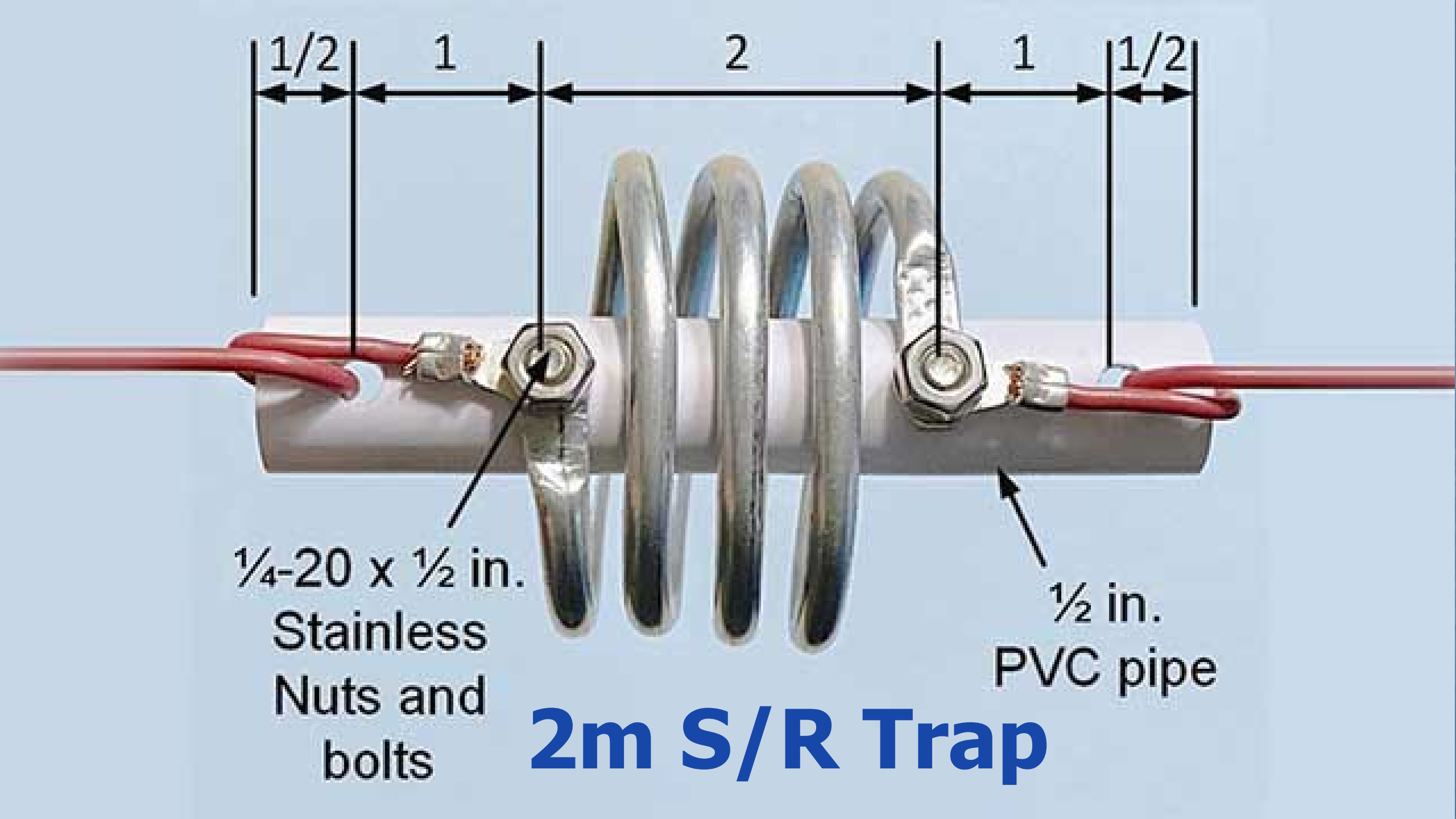
Self-Resonant Frequency



Designing a 2m-70cm-6m + S-R Trapped Dipole

Pick a Set of Coil Parameters Specifically for S-R

- A Diameter
- A Number of Turns
- A Turn Spacing -- Length
- That Creates Self-Resonance



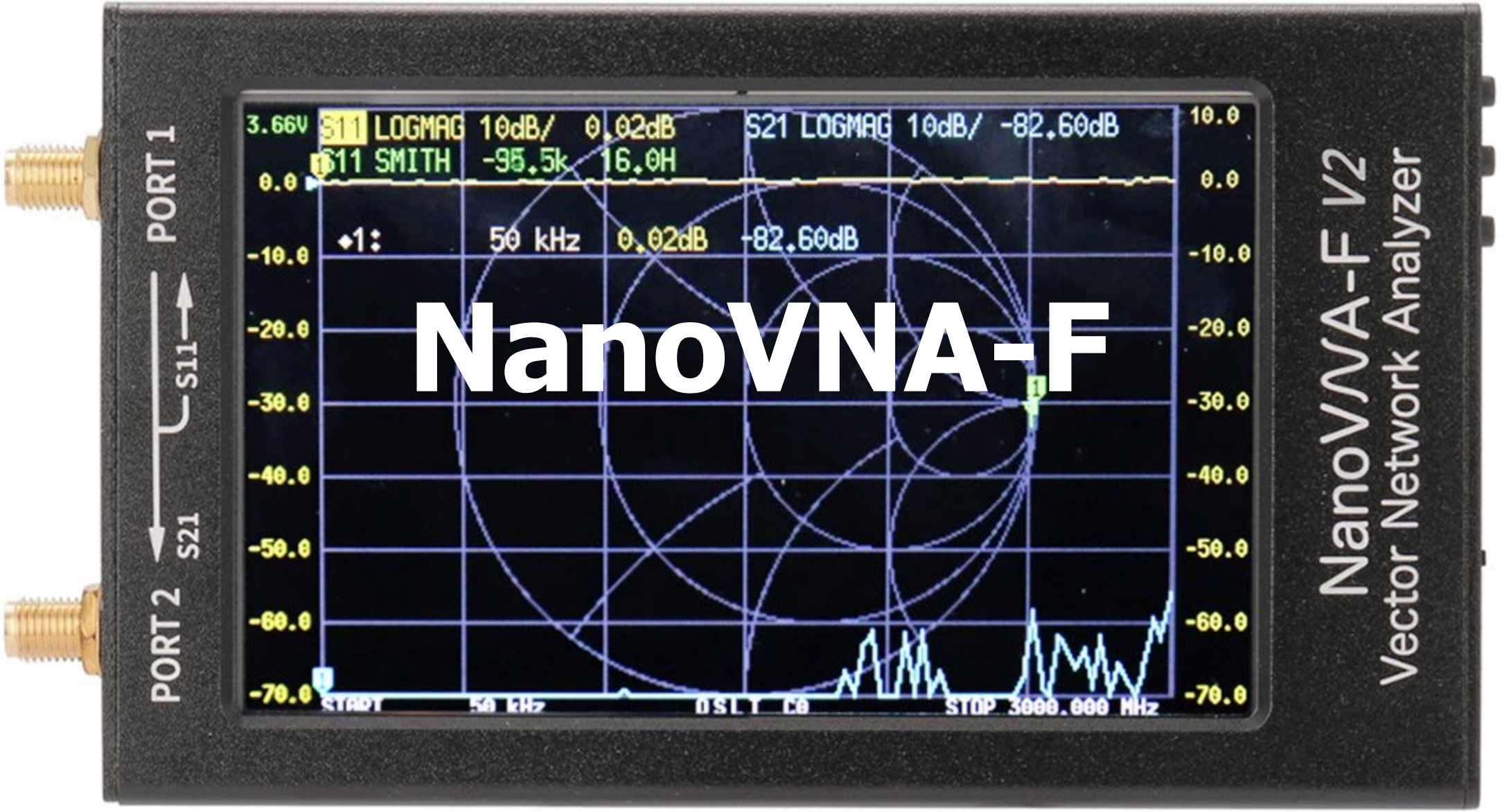
2m S/R Trap

https://www.teslascientific.com/products/coil-resonant-frequency-calculator/

Enter the Coil Length, Coil Diameter, and Number Of Turns		
Coil Length	2	Inches
Coil Diameter	2	Inches
Number Of Turns	4	
Conductor Length	25.133	Inches
Resonant Frequency	140.127	Megacycles/sec


"Dip"
Coil
"Tweak" the trap

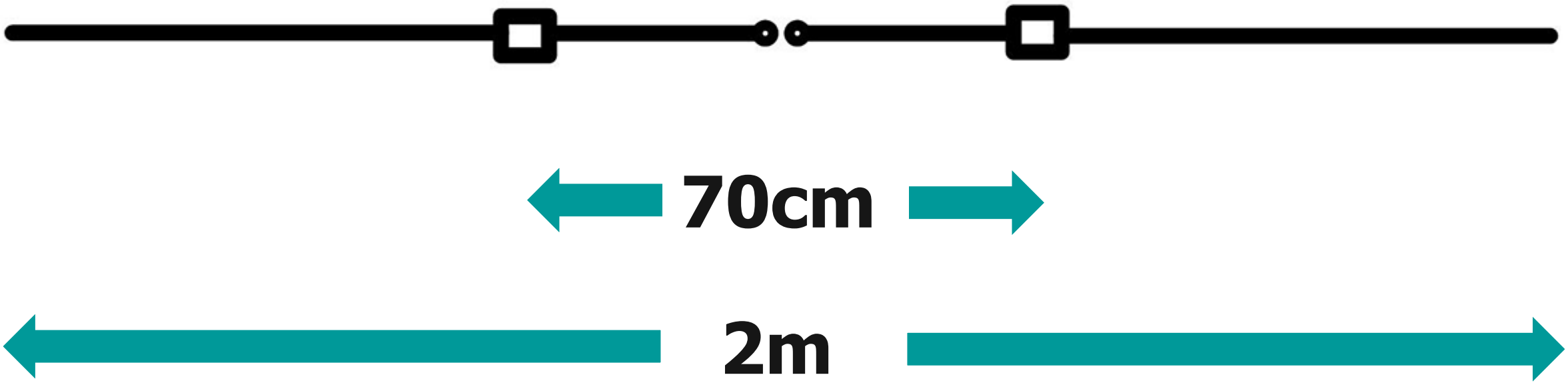
Trap "dips" At the Self-Resonant Frequency

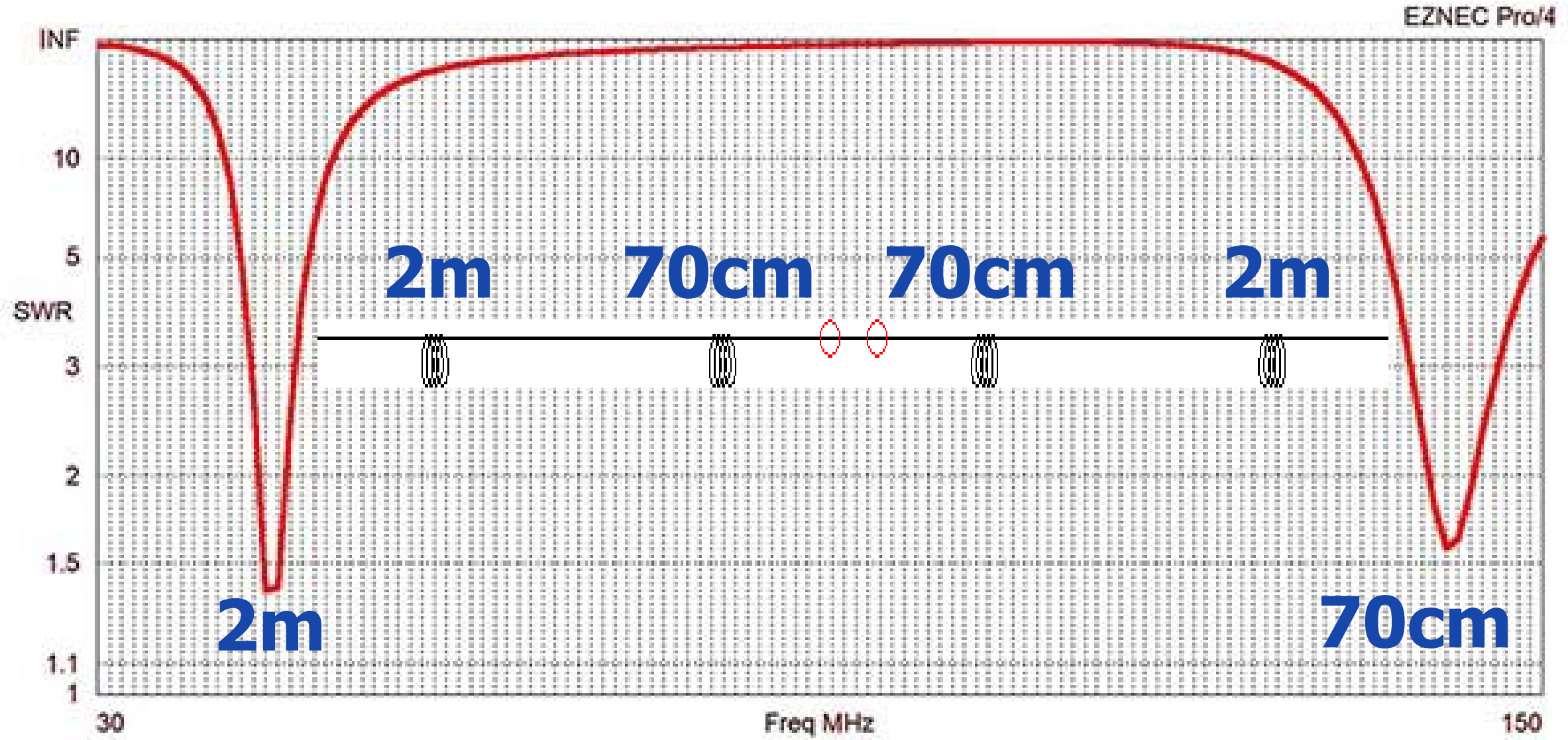


S21 Thru 2-port measurement

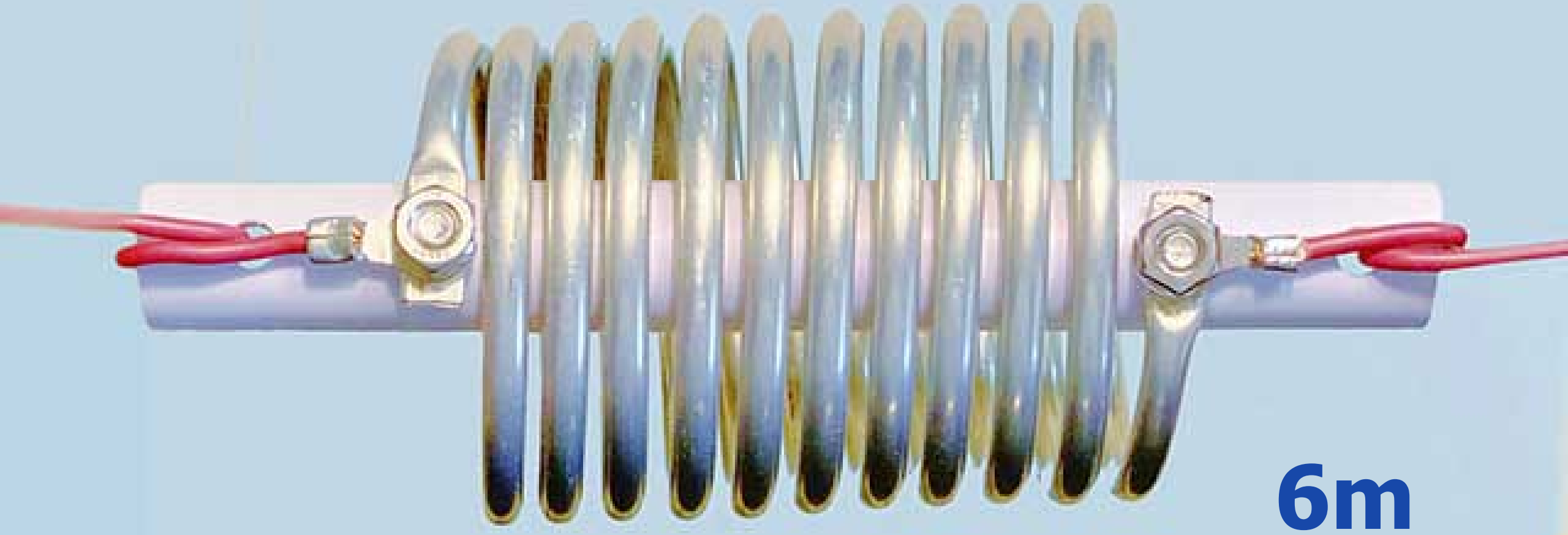
70cm S-R Trap

With 1 Pair of (70cm) Traps

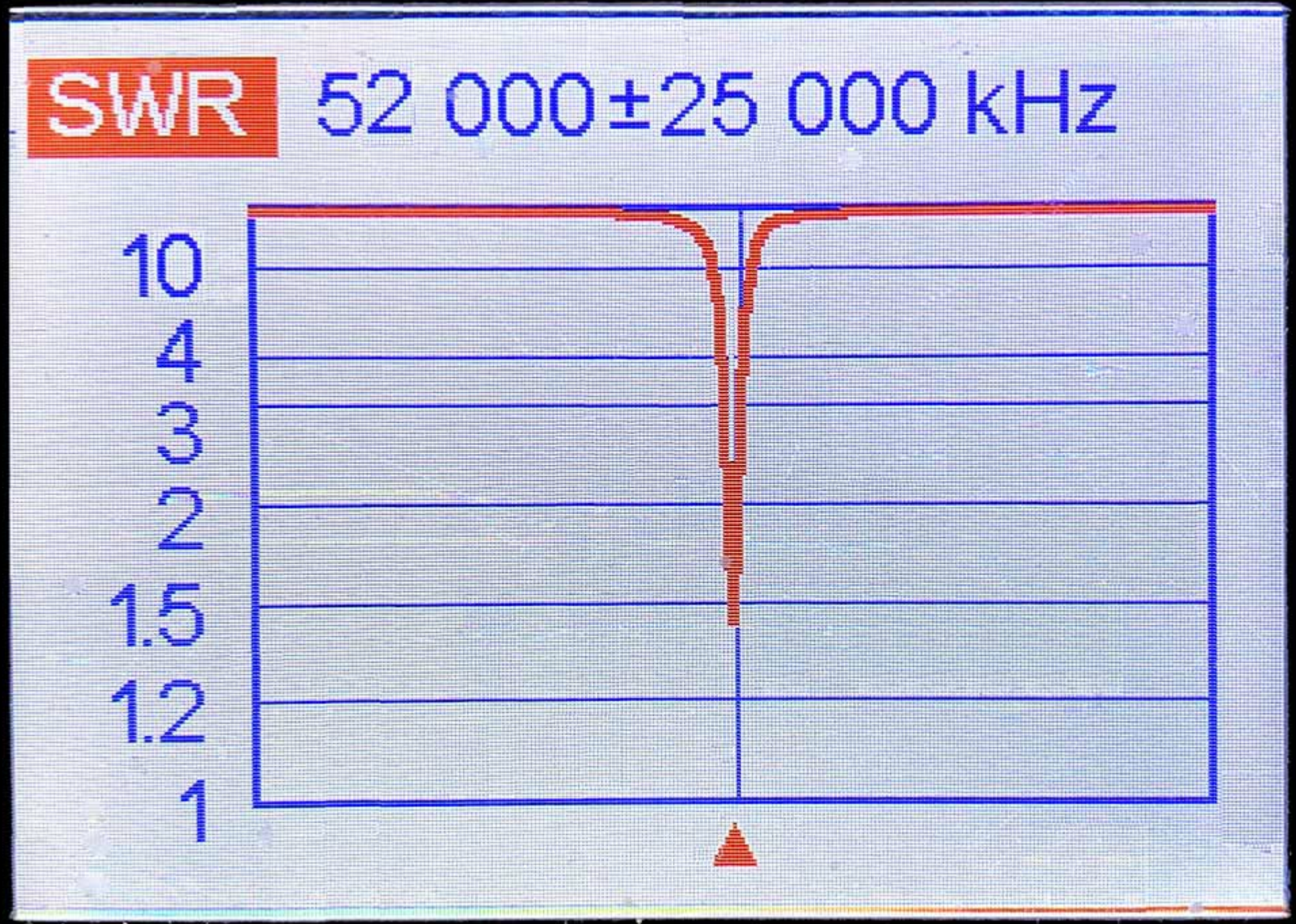



EZNEC Pro/4
INF
10
5
SWR
3
2
1.5
1.1
1
2m
70cm
70cm
2m
2m
70cm
30
Freq MHz
150

Adding Other Bands



6m
S-R Trap


SWR
52 000±25 000 kHz
10
4
3
2
1.5
1.2
1

70cm, 2m, 6m, Xm

Disguised Flagpole

In Development

10m/6m/2m/70cm

Coaxially-fed

1/2 Wavelength

No-radial

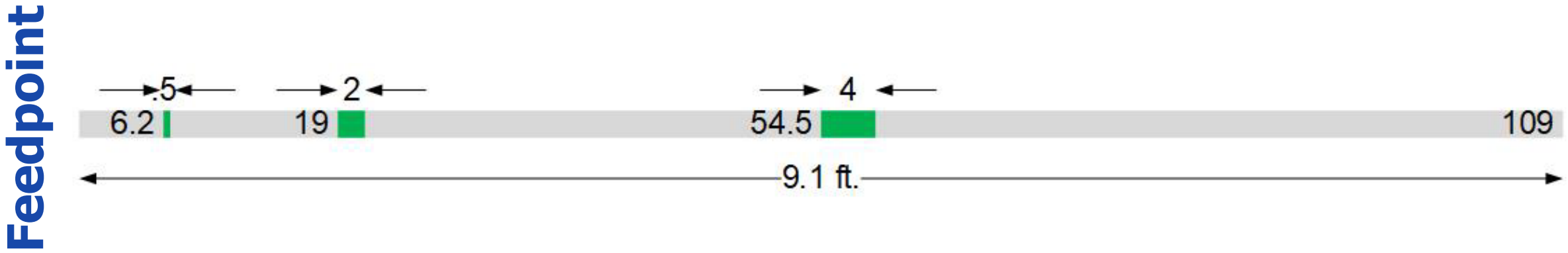
Free-standing

18 ft. Vertical

or Flagpole

In Development

1/2 of 18/20 ft. Vertical or Disguised Flagpole



Lower Bands

At Lower Frequency

- S-R Traps may be too large or heavy

Band	Turns	Coil Length in.
70-cm	1	0.5
220 MHz	2	1
2-meters	4	2
6-meters	13	6.5
10-meters	30	15
15-meters	42	21
17-meters	50	25
20-meters	68	34

At Lower Frequency

- Lower efficiency coils
- Smaller, closer-together windings
- Larger diameter coil

40/80/160 Meter Coil-loaded Inverted V Dipole Antenna

KGØZZ
www.amateurradio.bz

40 M
35' 10" (10.922 m)

KG0ZZ

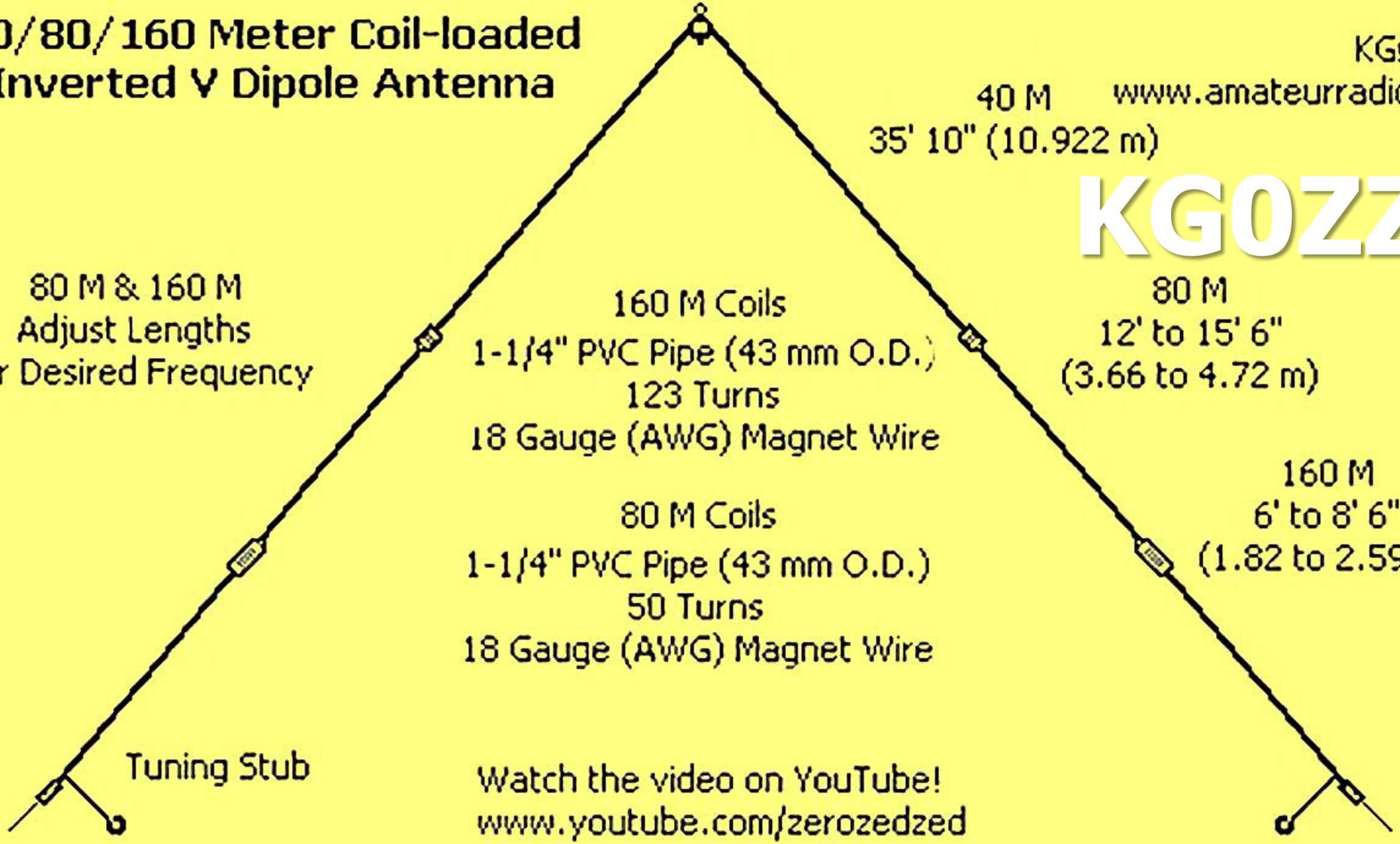
80 M & 160 M
Adjust Lengths
For Desired Frequency

160 M Coils
1-1/4" PVC Pipe (43 mm O.D.)
123 Turns
18 Gauge (AWG) Magnet Wire

80 M
12' to 15' 6"
(3.66 to 4.72 m)

80 M Coils
1-1/4" PVC Pipe (43 mm O.D.)
50 Turns
18 Gauge (AWG) Magnet Wire

160 M
6' to 8' 6"
(1.82 to 2.59 m)



Tuning Stub

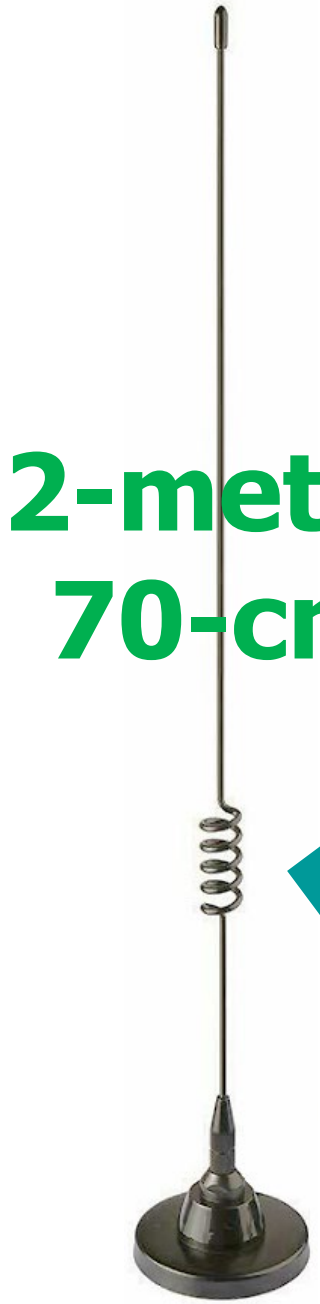
Watch the video on YouTube!
www.youtube.com/zerozedzed


KGØZZ
www.amateurradio.bz


KG0ZZ
www.amateurradio.bz
160m
80m
40m

https://www.teslascientific.com/products/coil-resonant-frequency-calculator/

So What is it?



2-meter
70-cm

Loading Coil
or a Trap

DØGGY

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/slides.html

w6nbcmail
@gmail.com