



March 24-26, 2023

Experiments With Unusual Materials for Magnetic Loop Antennas

John Portune / W6NBC



***This loop is an
unfinished experiment***

I don't have build-it plans

Many details must still be worked out

I want your suggestions

w6nbcmail@gmail.com

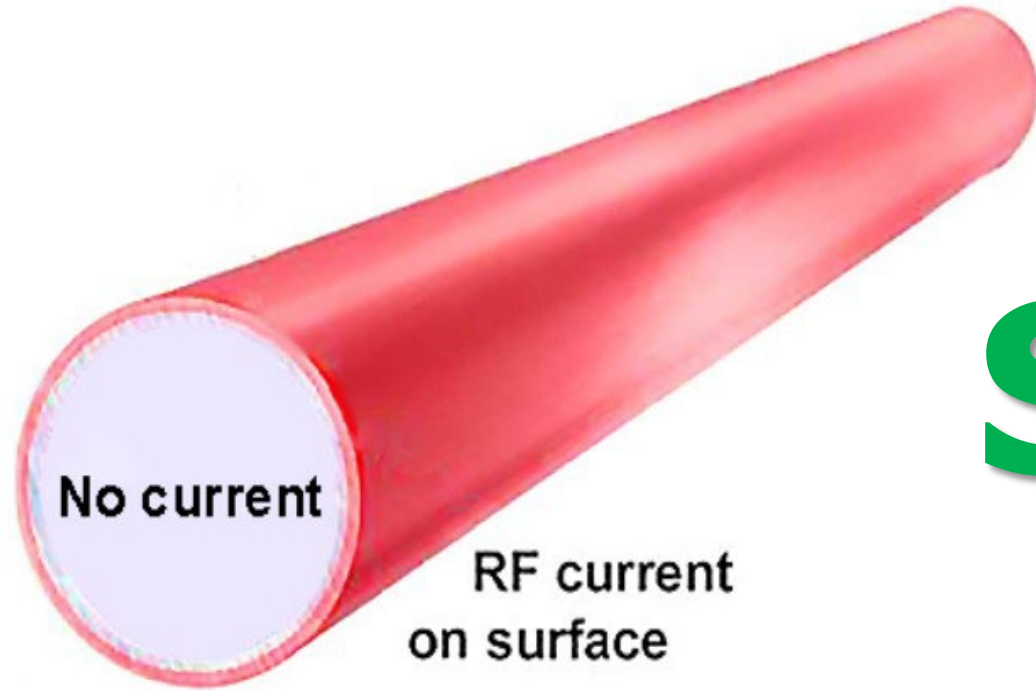
Power Point Slides: w6nbc.com/slides



A SURPRISE

*Copper pipe
work well
for mag loops*

**But it isn't
OPTIMAL or
necessary**



WHY?

Skin Effect

**The center of
the conductor
isn't needed**

More Optimal Materials



A Common Question

**Are There Other
Materials ?**

MG Chemicals Shielding Paints

Copper/Silver

Nickel



Copper Nickel



Conductive Fabric

Soft Conductive Copper Nickel Plated Electricity Magnetic RF Shielding Fabric for Smart Meters 39"x43"

Visit the Amradiel Store

★★★★☆ 38 ratings | 17 answered questions

\$13⁹⁹

≈ 0 Ω → Ohmmeter

✓prime

FREE Returns

Size: Width 43" inch / Length 39" inch

Width 43" inch / Length 39" inch

\$13.99

✓prime

Width 43" inch / Length 78" inch

\$24.99

✓prime

Width 43" inch / Length 197" inch

\$62.99

50 meters long

\$600.00

100 meters long

\$1,100.00

Material

Nickel+copper+polyester

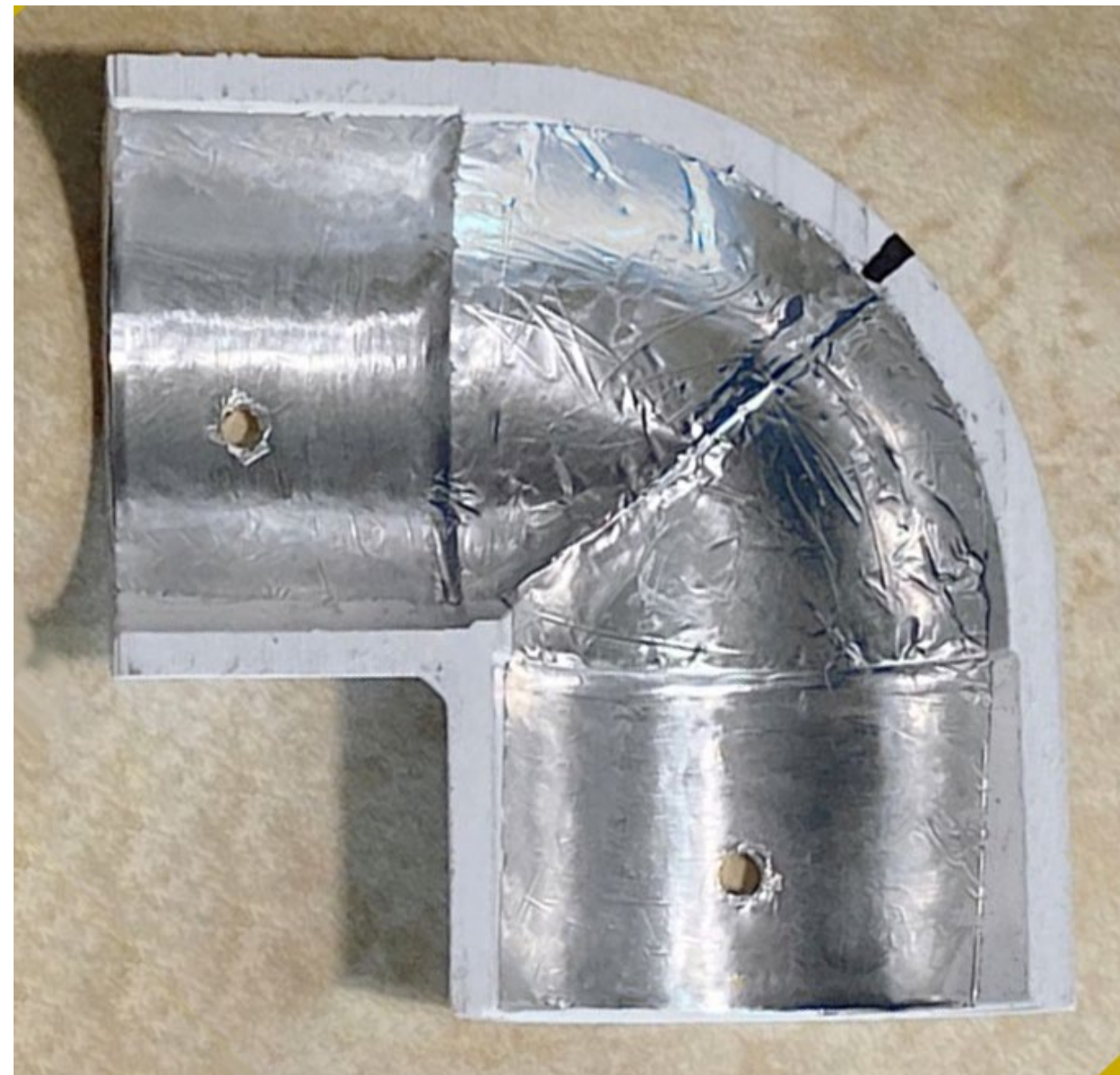
Color

Silver

Fabric Type

Polyester

**4 ft. square
optimized
PVC & foil
mag loop**



Mission Darkness TitanRF Faraday Tape High-Shielding Conductive Adhesive Tape Roll Used to Connect TitanRF Fabric Sheets or Seal RF Enclosures



1in x 10ft
\$10.00
(\$1.00 / Foot)

1in x 164ft
\$96.00
(\$0.59 / Foot)

2.5in x 10ft
\$20.00
(\$2.00 / Foot)

2.5in x 164ft
\$200.00
(\$1.22 / Foot)

10in x 10ft
\$45.00
(\$4.50 / Foot)

Faraday Curtains

**Shielding
Noise: In/Out**





Brand: Beistle
Foil Cone Hat
\$9.99



Joylife Metallic Bucket Hat
Amazon Prime \$14.99



Brand: Generic
Tin Foil Hat
for Conspiracy
Theorists

Price: \$34.99

Color:
White

Size: Select Size

Size Chart

Product Details

Fabric Type

Fit Type

Pattern





**Stainless
Steel**

**Conductive
Yarns**



Experimental
Magnetic Loop

For Portable Operation

HF Mountain Toppers, RV'ers, Portable

Radios ?

Power ?

Computer ?

Antenna – The problem

→ Small Whip? Wire over bush?





Magnetic Loop

- Small
- High Performance

Can it be made ?

- **Light** enough
- **Portable** enough

**POSSIBLE,
with the right
Materials**



**Mountain Bike Inner
tube
29 x 2.5-3 in.**



**Easily Inflates
to 4 in.**

**Add a
Conductive
Fabric casing
and
a break-down
PVC Stand**

Ready for Transport





Bell AirStrike CO2 Bicycle Tire Inflator

[Visit the Bell Store](#)

★★★★☆ 18 ratings

\$13⁵⁹

List Price: \$19.49 ⓘ

✓prime

Get a **\$100 Amazon.com Gift Card** upon approval for the Amazon Business American Express Card. Terms apply.

- Any Valve Pump Head allows you to easily connect to Presta or Schrader Valves without an adaptor, just press on to any valve
- The Bell CO2 inflator is a fast and easy way to inflate any bike tires while on the road or trail
- One 16g threaded cartridge included - one cartridge can inflate a completely flat tire
- Fits in jersey pocket or bike bag

🗨 [Report incorrect product information.](#)



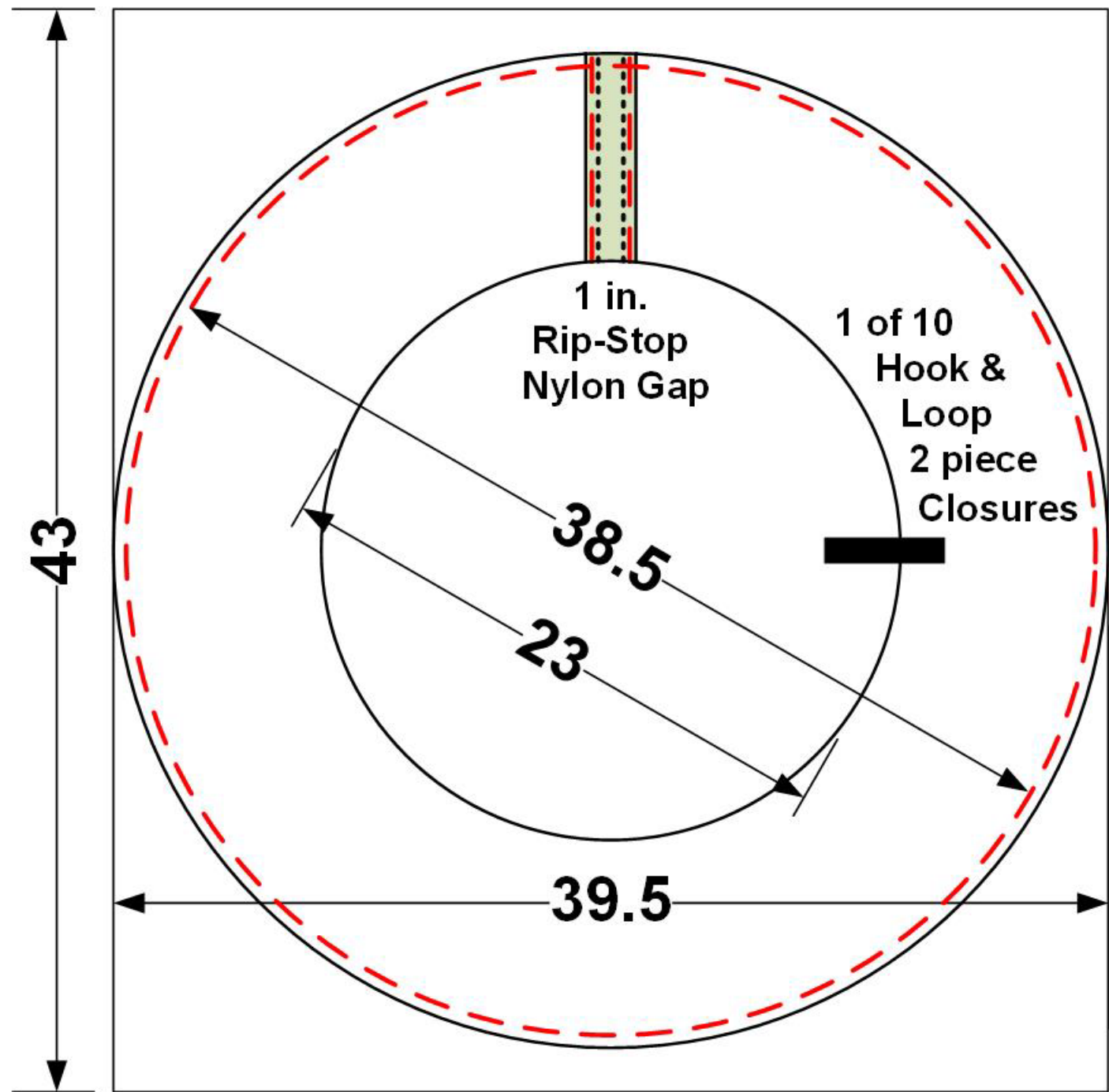
Gorilla Force, Value Pack 16g Threaded CO2 Cartridges, Fits All Bike Tire Inflators

★★★★☆ 3,155

\$12.99 ✓prime

Sewing Pattern

1 in. rip-stop nylon gap for tuning capacitor (width not critical)





Coats & Clark Dual Duty XP Heavy 125 YD Black Polyester

Brand: Coats

#14/16 machine needle



| 37 answered questions

\$4⁸¹ (\$0.01 / Foot)

✓prime

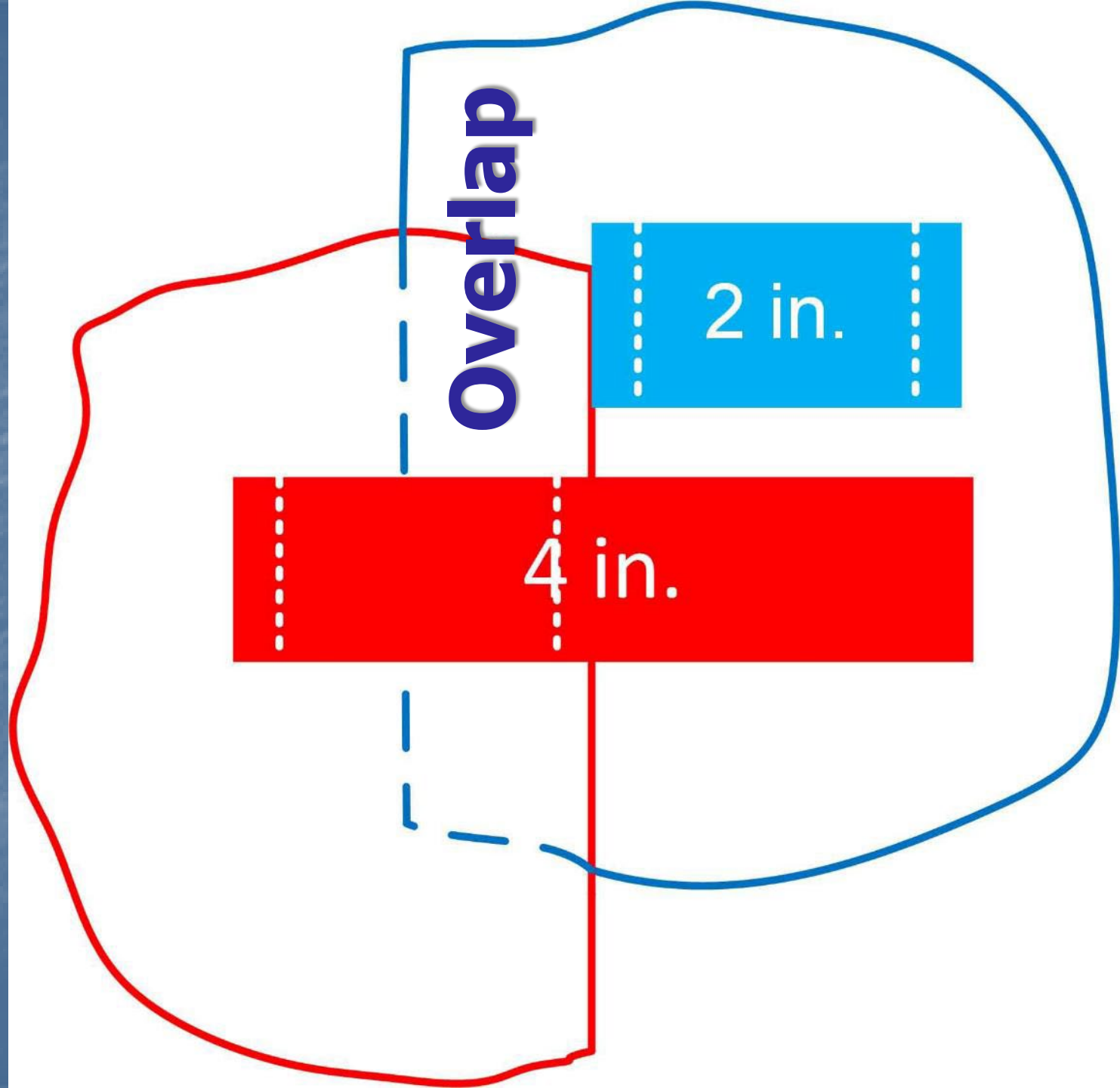
FREE Returns ▾

Save up to 6% with business pricing. Sign up for free Amazon Business account

Eligible for **amazon**smile donation.

10 Hook & Loop Loop (Velcro) Closures

(Offset for
illustration)



Finished Casing

10 one inch
hook and loop
closures

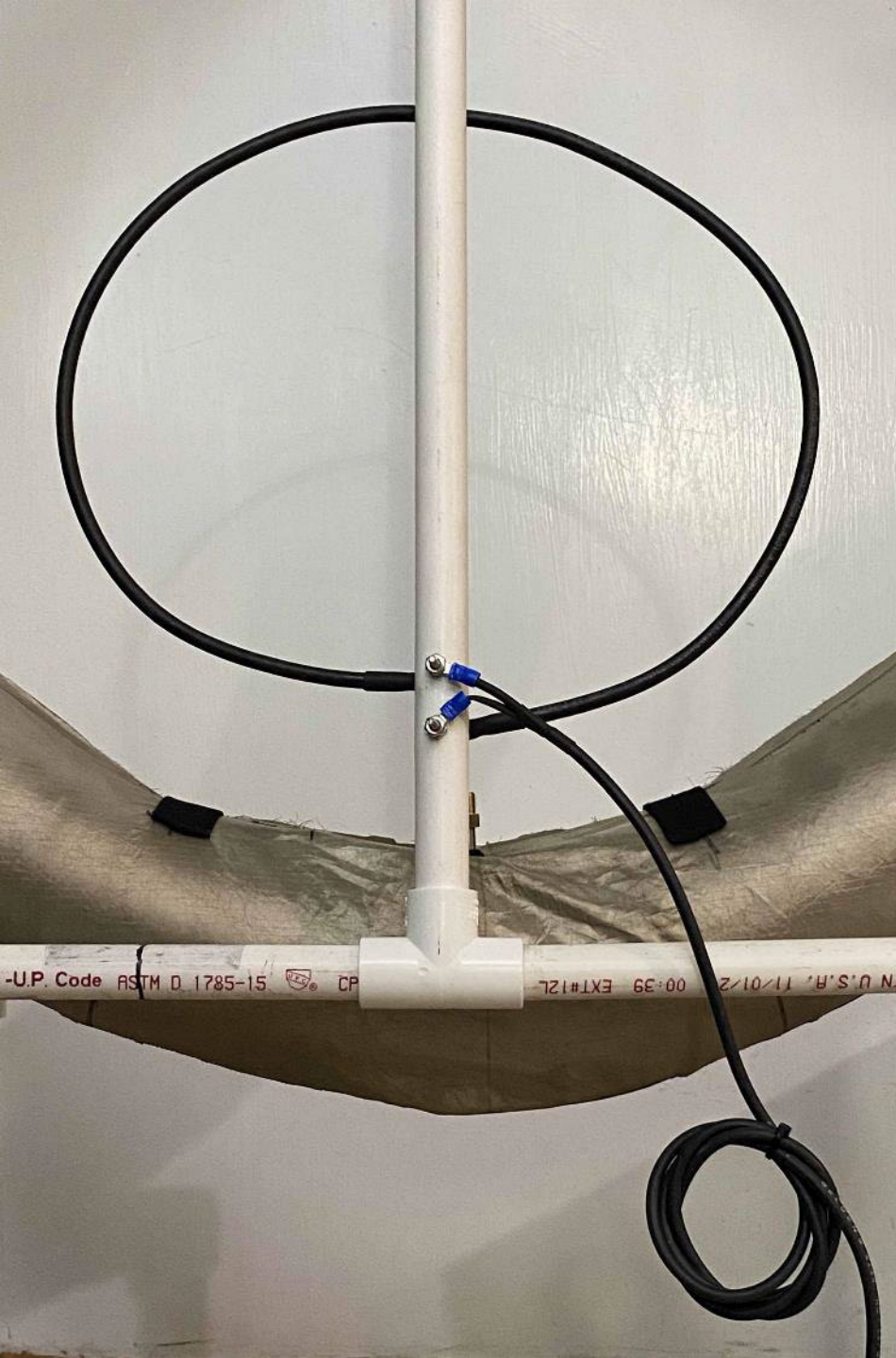
fabric overlaps





**Completed
Loop with
Coupling Loop
and Tuning
Capacitor(s)**

Coupling Loop



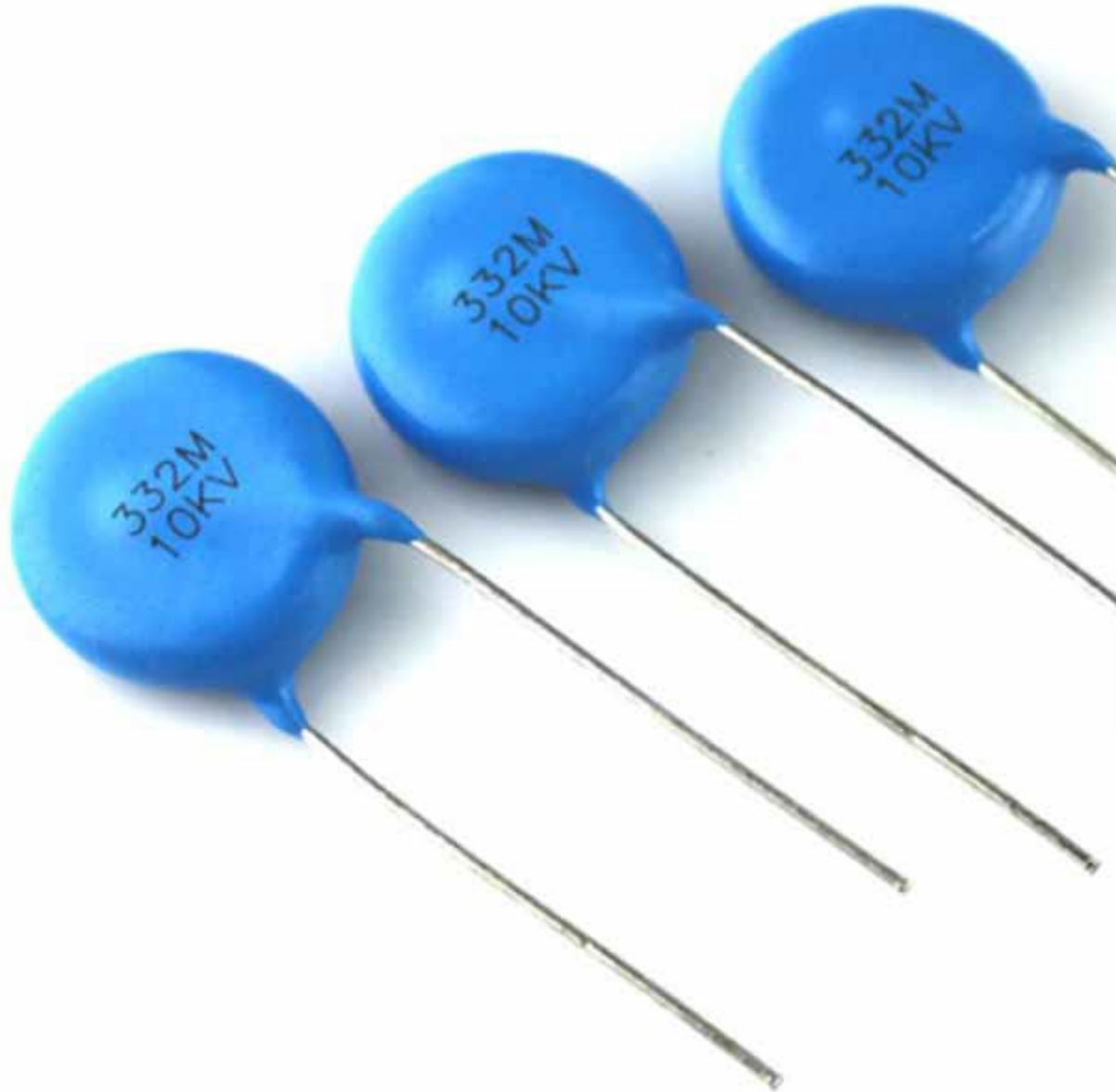
Traditional Small Separate Loop

RF
Transformer

Tuning Capacitor [S]

Band Tuning

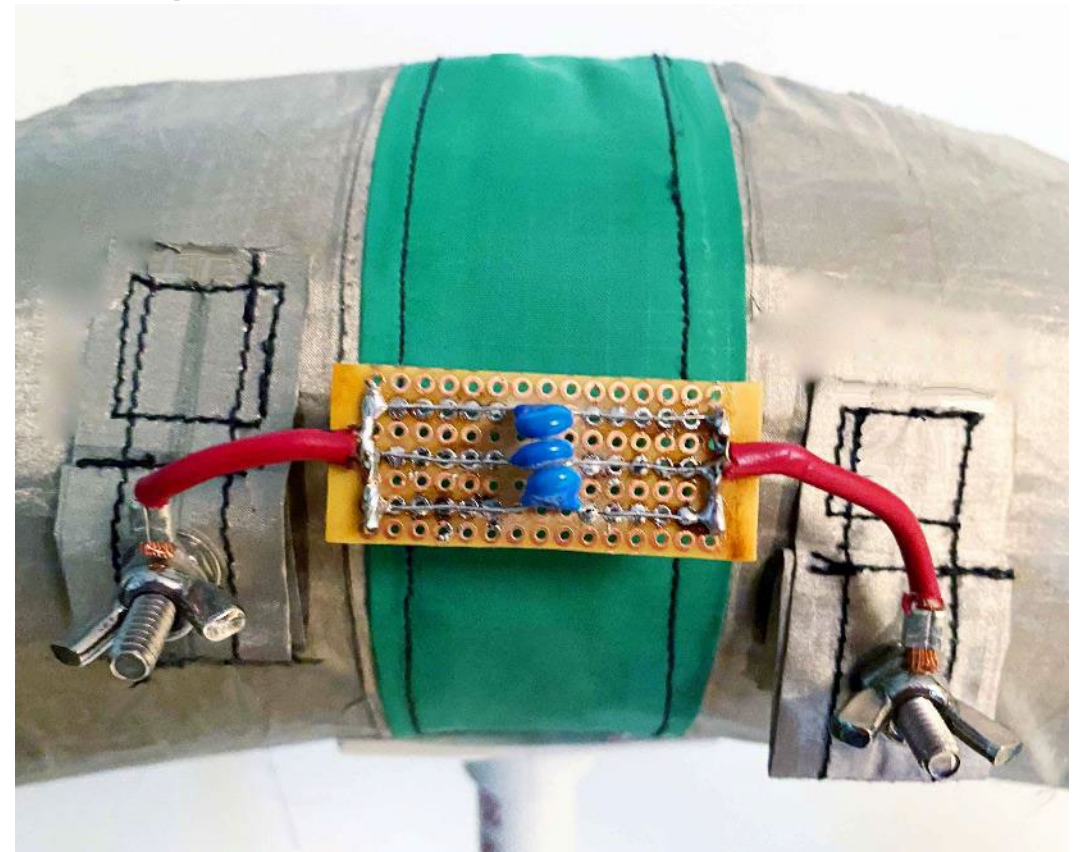
**High Voltage
Disc Ceramic
Capacitors**



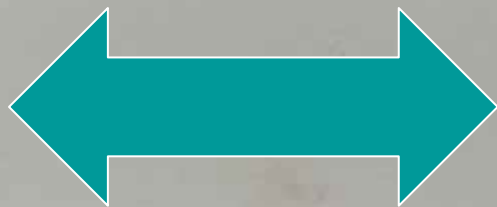
Band Tuning – 1 set/band

<http://www.iw5edi.com/software/magnetic-loop-calculator>

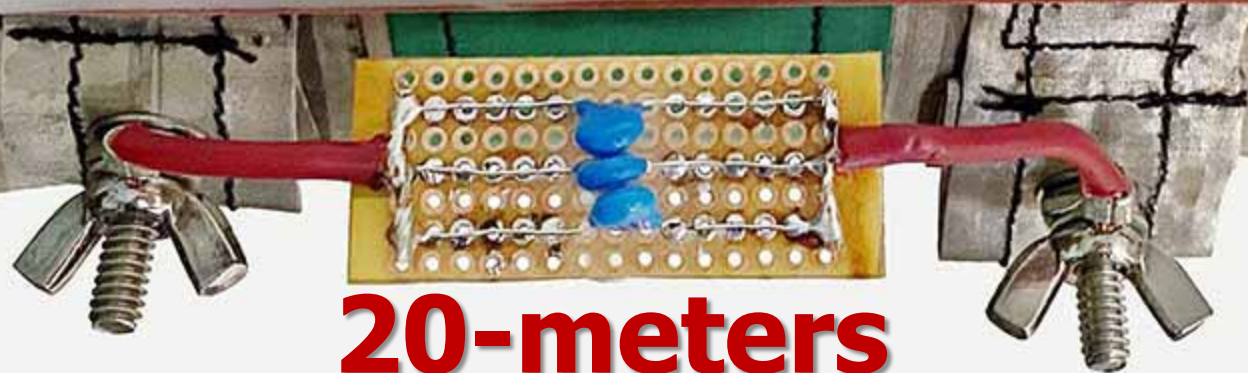
MHz	Cap. pf
1.8	5993
3.5	1385
7	339
14	79
21	30
28	13



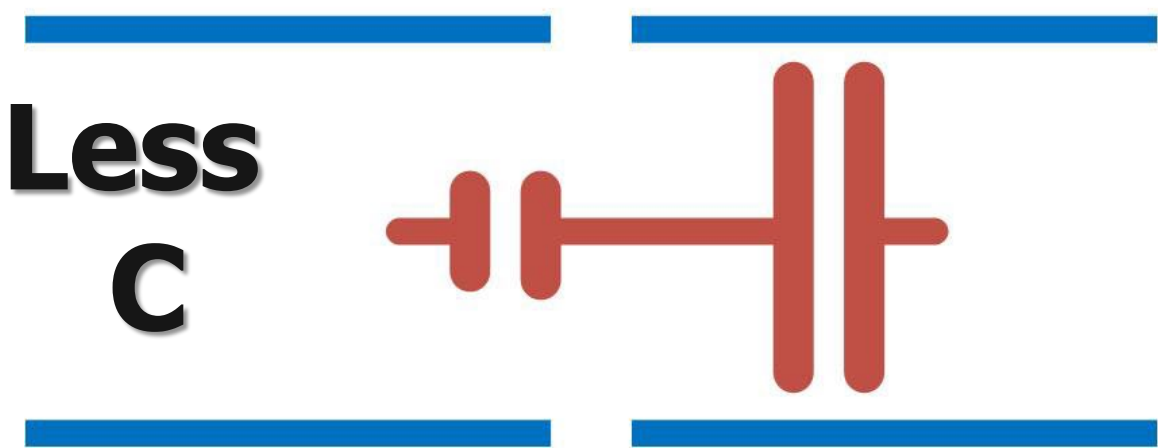
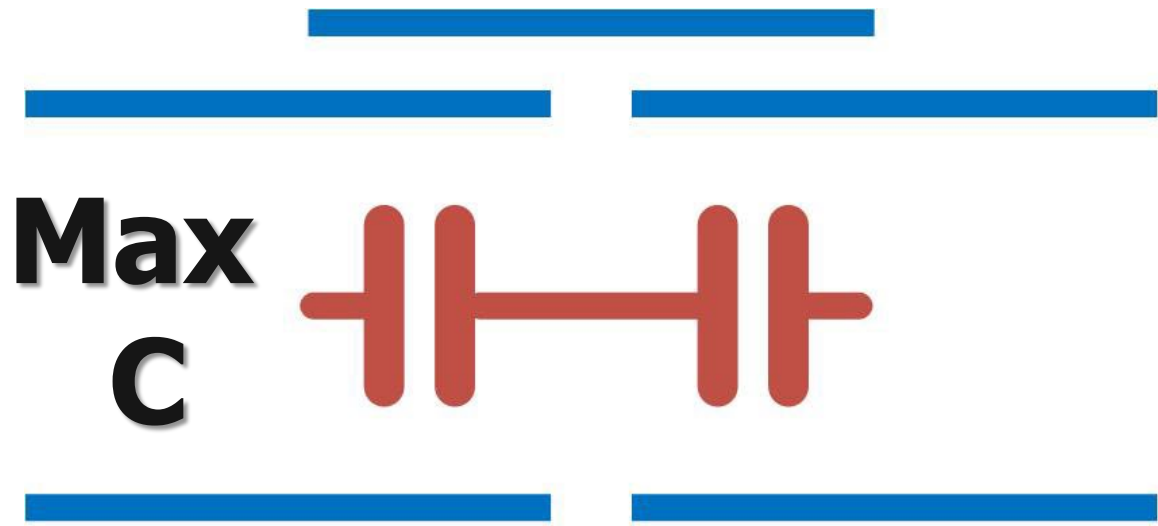
20-meters



**Linear fine
tuning capacitor
2 in. aluminum
tape**



20-meters



**Linear
Capacitor**

**Two
capacitors
in series**

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Questions and Answers

Beginning now

