

Summits On The Air



Getting HIGH with ham radio

Winter as
well as
Summer!



Mike, AD5A



Steve,
WG0AT



ULTRA-LYTE

Hiking any distance with your HF equipment is more enjoyable and easier if your equipment is relatively smaller and lighter. At first my goal was get the station under two pounds... then it became, get it under ONE pound !!!

THE RIG

Selecting the perfect radio
for YOU, depends upon
asking the right QUESTIONS

- How big is it?
- How much does it weigh?
- **How much current does it draw?**
- Resistance to interference from nearby transmitters?
- What capabilities are essential for your type of operation?

- NOTE: the less the current demand, the smaller (and lighter) your battery can be

An example comparison

The MTR3

Vs

Xiego X5105

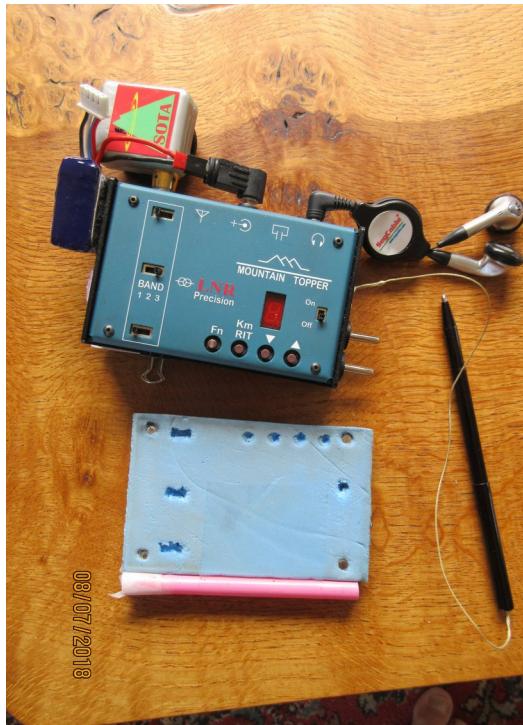
MTR3 KX2	X5105
2 1/4 x 4 x 3/4 3 x 6 x 1 1/2	4 x 6 x 2
6 oz 1 # w/ battery	2 #
5 watts 12 watts	5 watts
RX 18 mAH RX 150 mAH	RX 660 mAH
TX 1,000 mAH TX 1,300 mAH	TX 2,500 mAH
\$250 \$1,000	\$600
CW only SSB/digital	CW/SSB/digital CW/
(you see part of why CW is a popular SOTA mode ;-)	

THE RIG

The Elecraft KX2 and KX3 offer remarkable capability for relatively little size and weight. There are also inexpensive offerings from China.

My CW only rig of preference is the MTR originally kitted by KD1JV and now sold built by LNR. There are 3 band and 5 band versions.

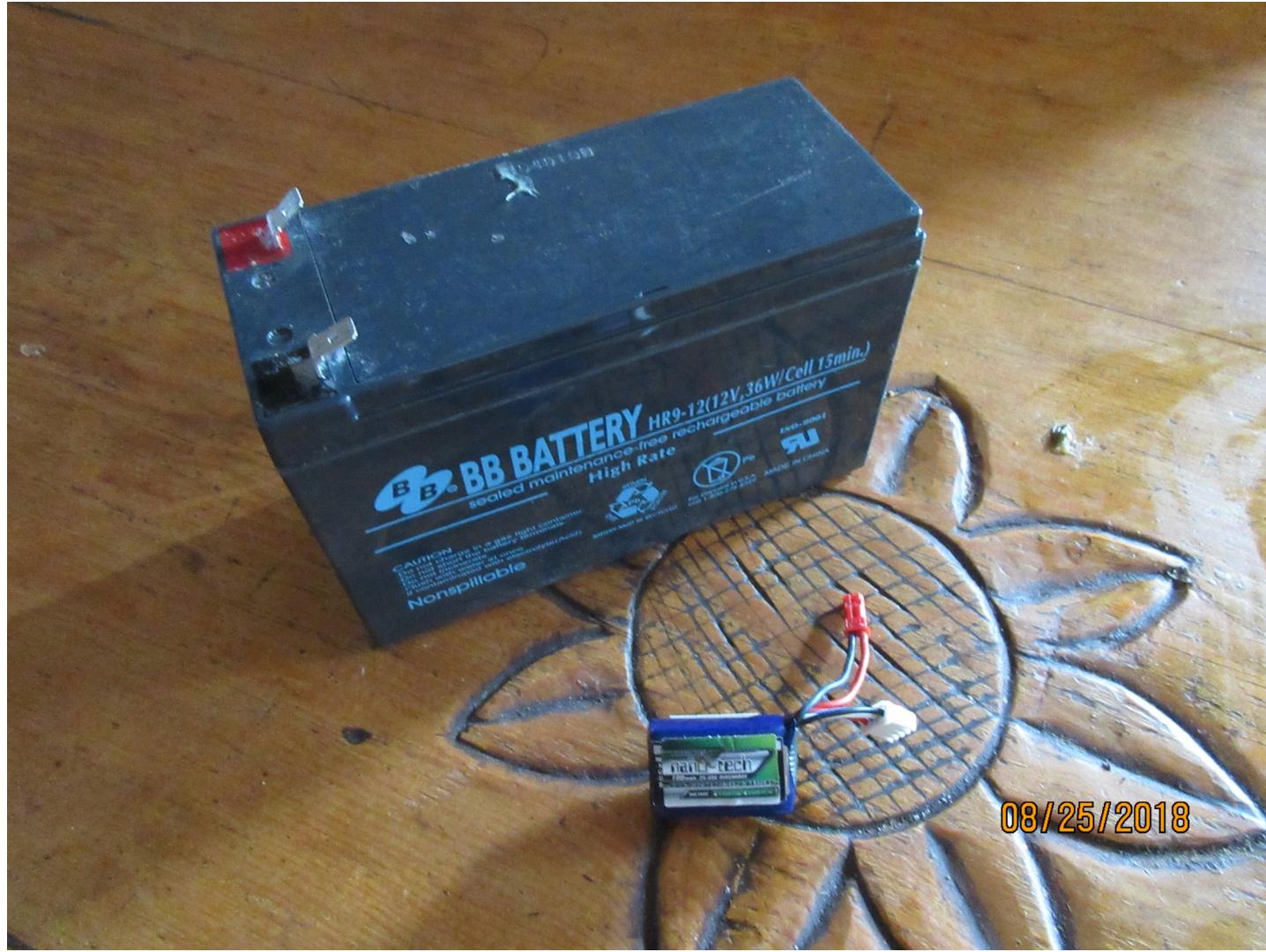
- To the MTR3 I added a built-in touch paddle, and an SWR indicator. The delicate face of the radio is protected by a piece of closed cell foam held in place with tiny magnets. A tuner appropriate for an end-fed halfwave antenna plugs in. The end of the wire plugs directly into that, no feedline. The retractable earbuds serve as all the counterpoise needed with an end-fed halfwave. There is a tethered mini-space-pen. A LiPO battery provides power. The entire set-up travels in a waterproof bag.



BATTERY

No longer are we saddled with a five pound SLAB !!!!

The thumbnail sized one ounce LiFEPO4 seen here can provide enough power for up to a one hour SOTA CW activation IF the selected radio has a low power consumption!



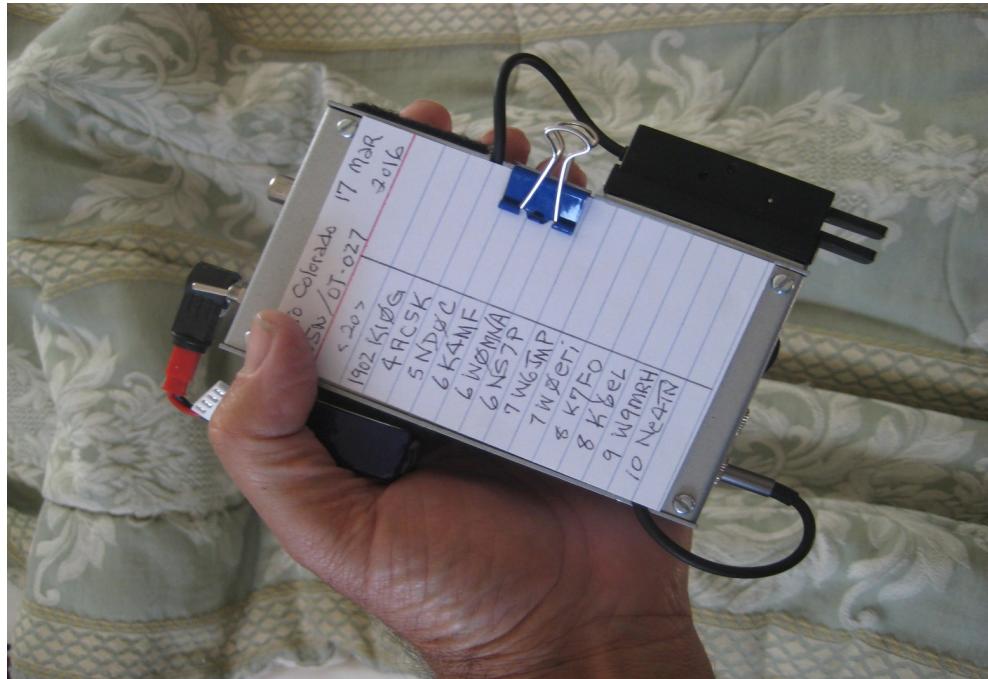
PADDLE

If CW, then something for a paddle is needed.

There are many QRP paddle offerings

A paddle at home weighs several pounds and sits on the desk. In the field some folks strap it to their knee. I prefer to attach it to the radio.

Pico Palm weighs about an ounce and magnetically attaches



TOUCH PADDLE

Advantages of a “touch” paddle:

- No contacts to get dirty

- No adjustments to be misaligned during transport

- Small and light

You can see the home made paddle posts protruding from the bottom edge of the MTR3



LOGGING

Commonly used methods...

- Clipboard
- KX2 built-in recording of your transmission
- Recording on Smart Phone
- Or my method: using the back of the MTR as my clipboard

- NOTE: normal pens will not write at high altitude (above 10,000 ft) because they depend upon atmospheric pressure for the ink to flow.
- Use a variant of the SPACEPEN. My mini-spacepen weighs 6 grams, writes upside down under water on butter.
- AND ... TETHER IT!

ANTENNA

Light

Durable

Versatile set-up

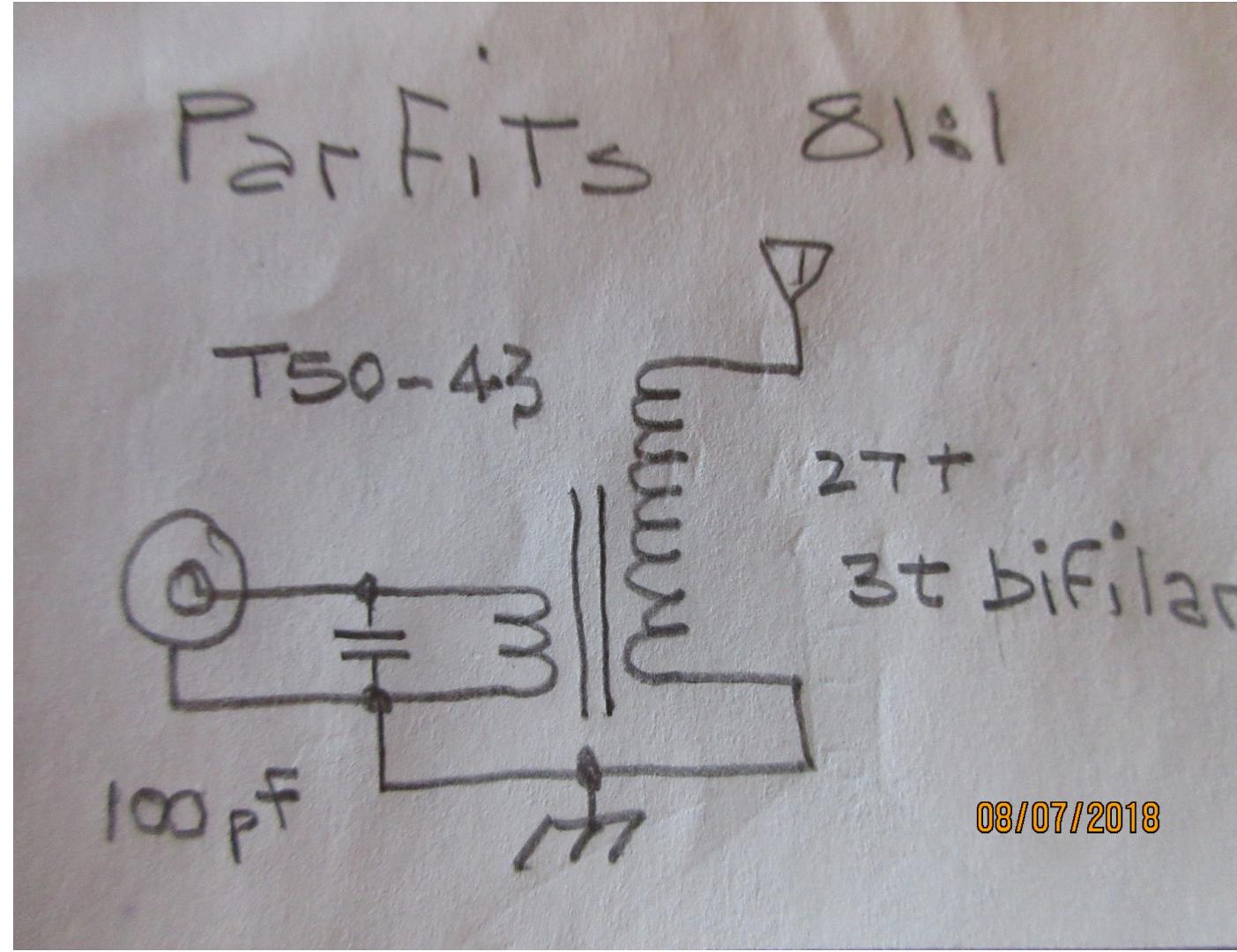
Quick set-up

- * Dipole ???
 - * Inverted Vee ???
 - * Vertical ???
-
- * End-Fed Halfwave !!!

Matching

An end-fed halfwave

Simple circuit can match a resonant EFWH for any band from 15M to 40M.



QRP version

Can be built into a dental floss case and weigh about a half ounce! Plug the end of the wire in directly, and avoid any feedline at all!



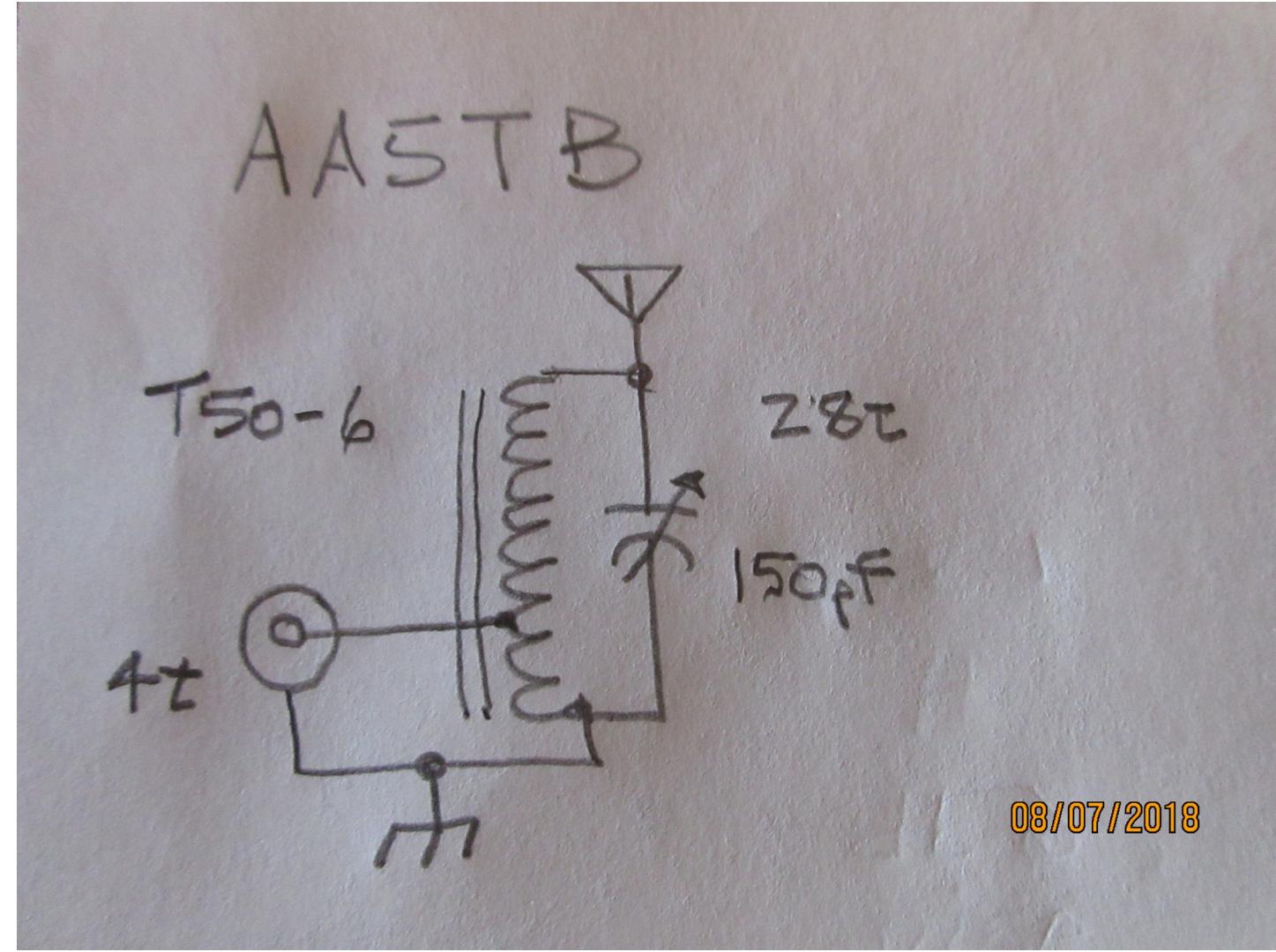
A Glance inside

A T50-43 core may be used,
this one used a T80-43 core
and still only weighs 17
grams.



TUNABLE EFHW matching device

This device can match a slightly larger range of set-up environments and when properly adjusted has slightly less loss.



Homebrew EFHW impedance transformer

This too can fit in a dental
floss case and weigh less
than an ounce



SWR Meter

It isn't necessary to know the actual SWR. It is only necessary to know when it is minimal for the purposes to tuning.

This SWR indicator is suitable for 3-5 watts, weighs 1.5 grams, and is about the size of a thumbnail.



Tiny SWR mtr

Pioneered by DK3IT, the circuit board is available from OSH PARK for about a dollar.

Here, you see the LED's of the indicator squeezed into my MTR3

Search “tinySWR” for details

<http://ae5x.blogspot.com/2017/10/kit-tinyswr-truly-small-swr-indicator.html>



ANTENNA SUPPORT

Some peaks are desert dry and treeless, some are above treeline. Prepare to set up the same way every time, with or without trees.

- There are fishing poles that are 20 feet tall and yet may weigh as little as six ounces. The trick is to keep the antenna so light that such a flimsy pole can support it. An EFWH made with #28 wire may have a total weight under two ounces.
- My most modest support pole weighs just six ounces, collapses to just 18 inches in length, yet can stand 18 feet tall. This is plenty of height when on a mountain peak (unless it is a molehill in Ohio ;-)

ONE POUND complete 20/30/40 meter CW station

MTR3 shown with battery,
touch paddle, earbuds on
retractable cable,
tethered space-pen,
tuner, log on the back, in
waterproof bag

3-band trapped EFHW
antenna

18 ft support pole



PACK

At this point, the heaviest thing being carried is ... THE PACK itself. Enter, the "Runners' Pack!"

This pack is made of nylon gauze and weighs only 9 oz. It can carry 64 oz water bladder, two 15oz water bottles, raincoat, food bars, and the entire station.

Note the squeeze water bottle (light) with built-in filter! If there are known water sources on a hike, this bottle alone may serve to provide one's entire water supply eliminating the otherwise heaviest item, water!



band'ing an EFWH wire

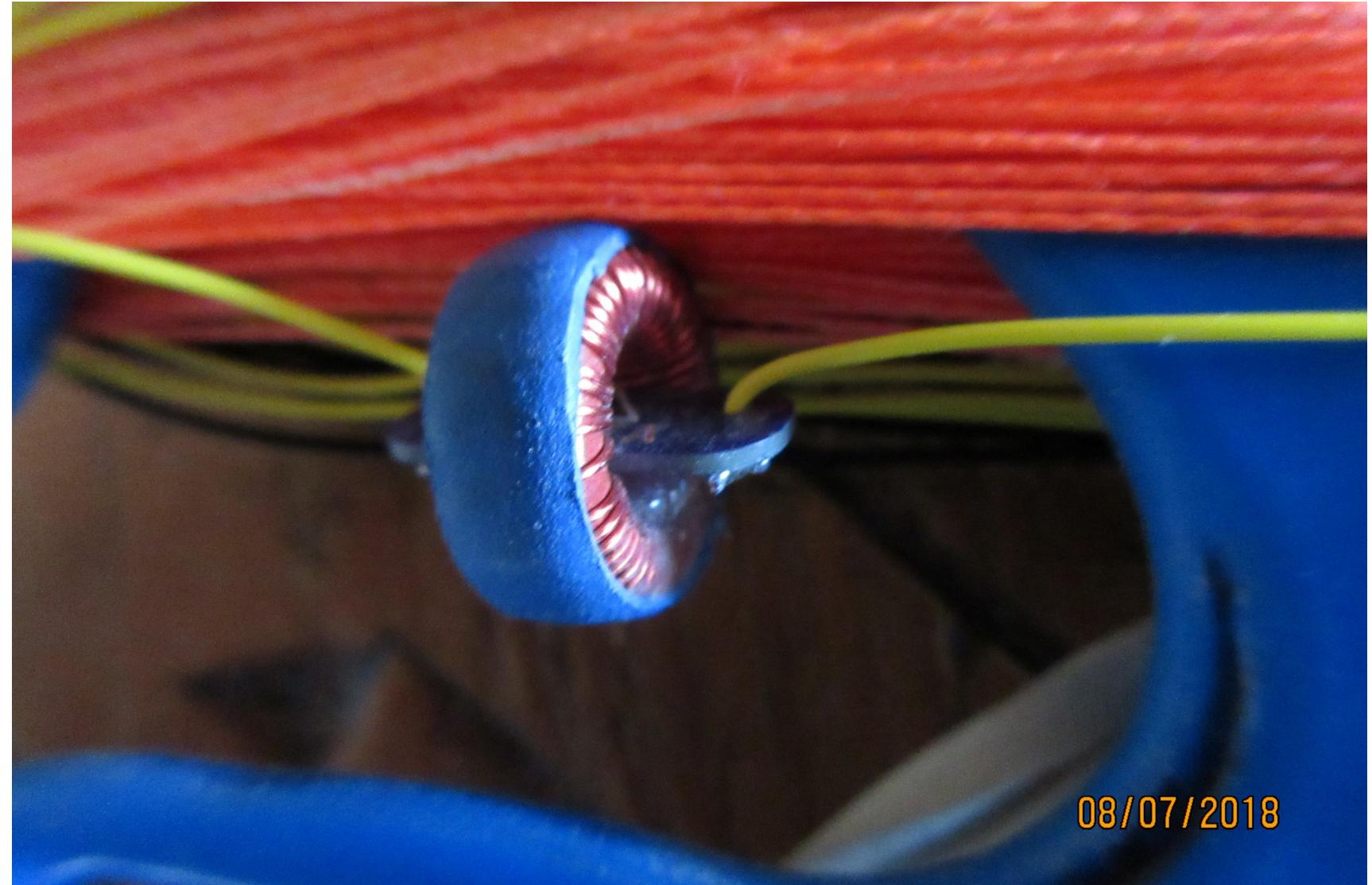
Links that can be unplugged
by hand, or...

Miniature SPST toggle
switches that can be toggled
by hand, or...

Miniature traps... A trap is a
tuned circuit, an inductance
and a capacitance in parallel.

When feeding on the end,
only one trap is needed for
each additional band.

The inductance of the trap
shortens the wire needed to
resonate the lower
frequencies.



08/07/2018

TRAP construction

The capacitor can be a 500V SMD component. The inductor can be wound on a toroid. The traps made here weigh only 2.5 grams and the loss is less than a half DB.

The antenna wire is #28 silver Teflon, and the support line is 50 pound test fishing braid which does not stretch, is essentially weightless and has essentially no wind resistance.

This 20/30/40 trapped wire weighs under two ounces,



WGOAT builds one...

Woohoo! ...Very Happy!!! all three bands with 'fixed' EFHW Xformer are now 1.5:1 or better with Vee or sloping or flat top configuration over moderate soil!!! Thank you, Fred!! (2-meters of RG-174 btw)

Steve, WGOAT



The ULTIMATE trapped EFW Challenge...

OK, let's see you do FIVE
BANDS on one trapped wire!

15/17/20/30/40 meters ...

I GIVE UP !!!

For that, may I introduce
Four-times a Mountain Goat,
Super-Activator, and an
engineer, John, K1JD...

