

CVARC
100W Portable Antenna
K6ARK Kit Build

Kits and Parts Distribution

- Purchase and distribute the provided kits
 - K6ARK Kit \$28
 - Antenna Wire \$7 for 40M EFHW
 - 83 Feet for = 67 Ft HW + 16 Ft Counter Poise
 - 22 Gauge multistrand silicone insulation
 - 2mm Banana connector sets x 2 + Heatshrink
 - Support Cord

- $1000/83 = 12$ Kits, $250/83 = 3$ Kits. Have 1 Roll 1000, 2 rolls 250.

Overview

- Talk about antenna
- Talk about soldering
- Build kit
- Tune antenna

Antenna – EFHW Impedance

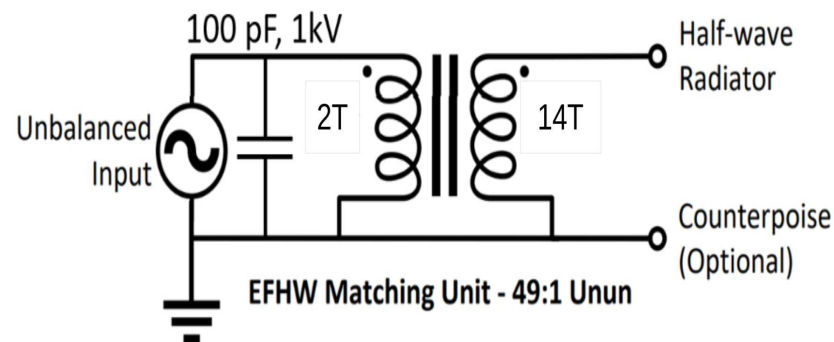
- EFHW = End Fed Half Wave
- This is a wire antenna driven at one end that is half wavelength of the operating frequency in length
- EFHW impedance is ~ 2450 ohms
- We make a 49:1 transformer matches to 50ohm transceiver, add a capacitor to input

Antenna – EFRW

- EFRW = End Fed Random Wire
- Focus of the build is the EFHW
- See last slides for build notes
- This is a wire antenna driven at one end that is an odd length of the
- We make a 9:1 transformer matches to 50ohm transceiver, add a capacitor to input

Antenna – EFHW Transformer + Capacitor

- 49:1??? $50 \times 49 = 2450!!!$
- 2 turns on input, 14 turns on output
- 100pF High Voltage capacitor



Antenna – EFHW Field Use

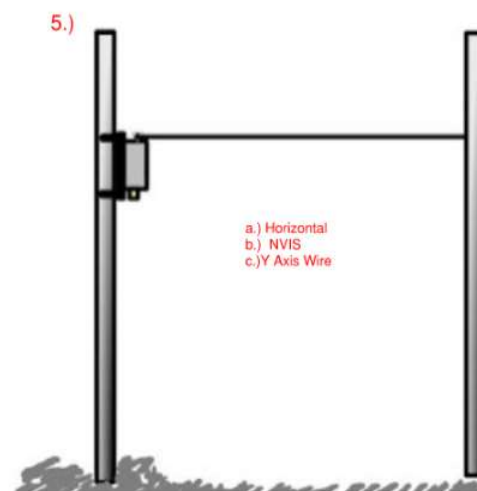
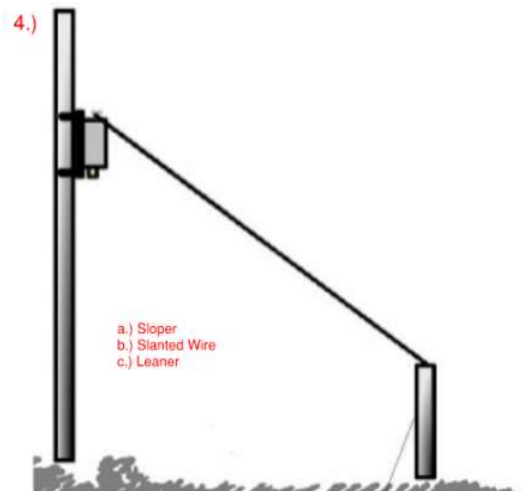
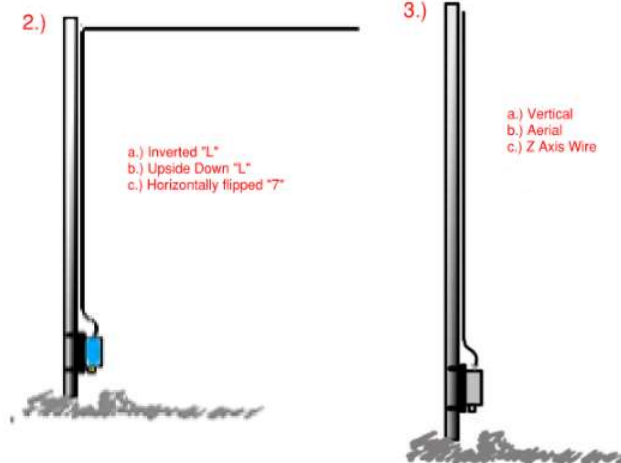
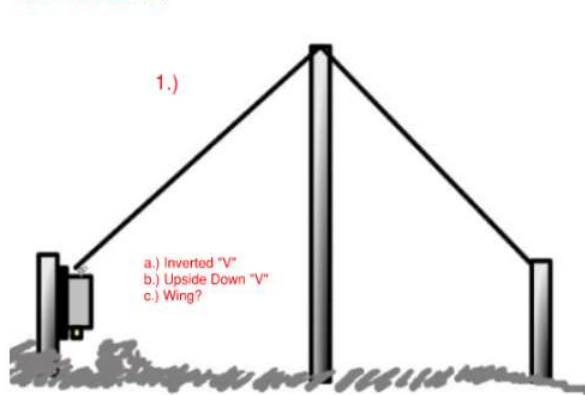
- EFHW Makes good portable for field use
- One Support



Antenna – Other Setups

- See build instructions for other configs!

EFHW Antenna



Soldering – putting together

- Verb: to bring into or restore to firm union
- Melting metal (tin/lead) with soldering iron
- 180 deg C / 361 deg F for 60/40
- Use flux to help solder flow – add or built in
- Heat both parts then apply solder
- Let solder flow and then remove heat

Soldering- practical

- Big & small – Vintage radios to modern PCBs
- Small and paste, paste mask
- Wave solder to infra red soldering
- Thru hole to surface mount components
- Small tips and small solder
- Pick and Place parts with robotics
- Samples! Microscope!
- Lots of info on alloys etc. on Wiki!

Build Kit- Parts

Parts List

QRP Kit:

	Item	Qty
1	-43 mix Toroid	1
2	22 ga Magnet Wire	~60"
3	18 ga Poly Stealth Wire	~10"
4	Plastic Coil Form	~2"
5	3/4" Heat Shrink Tubing	~2"
6	2" Heat Shrink Tubing	~2"
7	3/16" Heat Shrink Tubing	~1"
8	SO-239 Connector	1
9	3d Printed Spacer	1
10	K6ARK Sticker	1
11	Custom PCB	1
12	100 pF SMD Capacitor	1



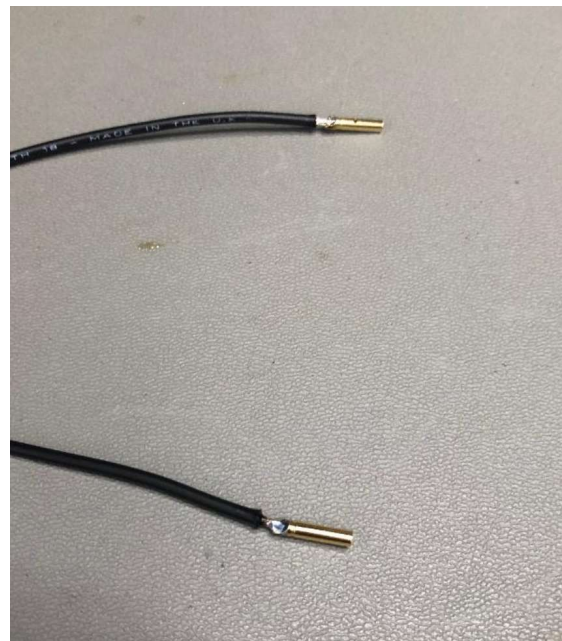
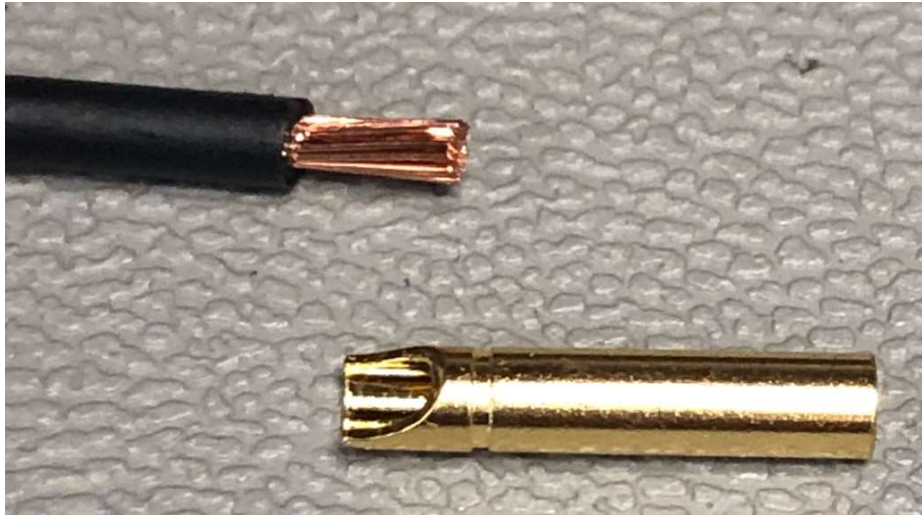
Build Kit – SMD Cap

- Solder the SMD capacitor!
- Put small solder on one pad
- Hold part with tweezers and tack down one side
- Solder unsoldered side, then reflow tacked side
- You did it!

Build Kit – Radiating & CP wires

- Strip wire that is provided in kit – about 1/8 inch
- Place wire thru strain relief hole as shown in build instructions
- Solder banana connector –
 - Hold connector with needle nose or third hand
 - Then solder wire to connector

Build Kit – Radiating & CP wires



Build Kit – S0239 Install

- Install withOUT the provided ground lug
- Install WITH washer
- Ant jack on SAME side a capacitor
- Tighten nut with pliers/wrench

Build Kit – SO239 Center Pin

- Cut/strip 1 inch magnet wire
- Solder from SO-239 center to PCB
'CENTER PIN'

Build Kit – Wind Coil

- 2 turns Counter Clockwise on torroid as shown



Build Kit – Wind Coil

- Make a loop 2 inches long as shown then twist



Build Kit – Wind Coil

- Make a loop 2 inches long as shown then twist

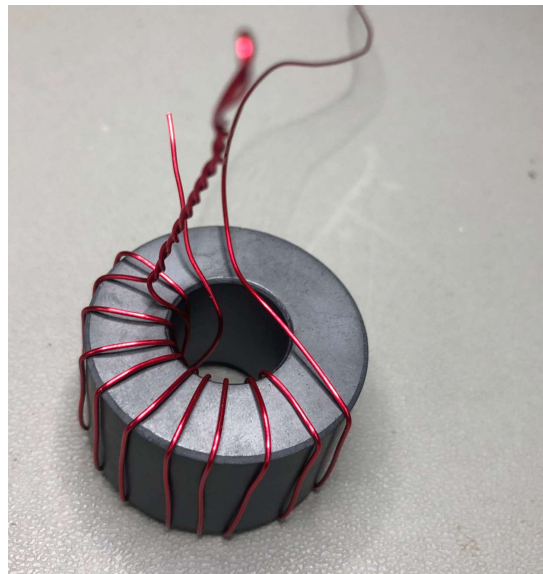
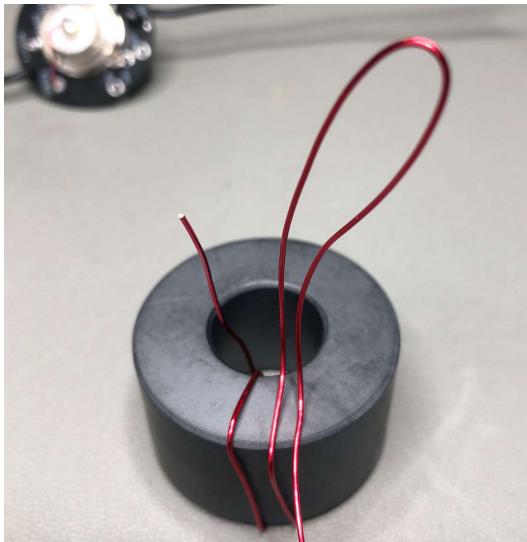
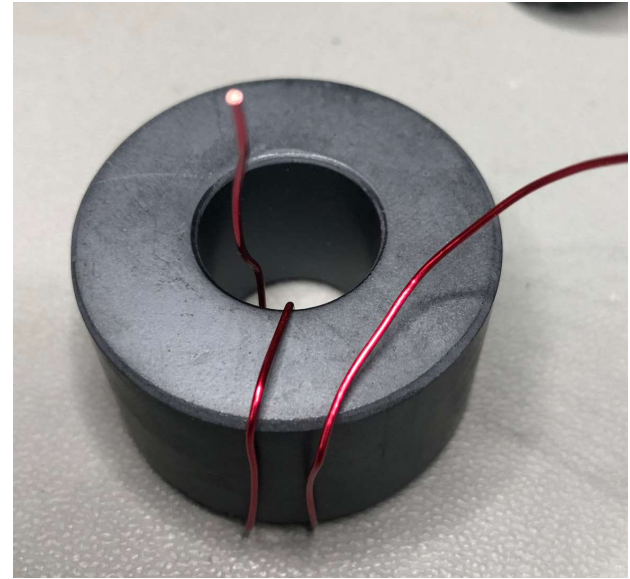
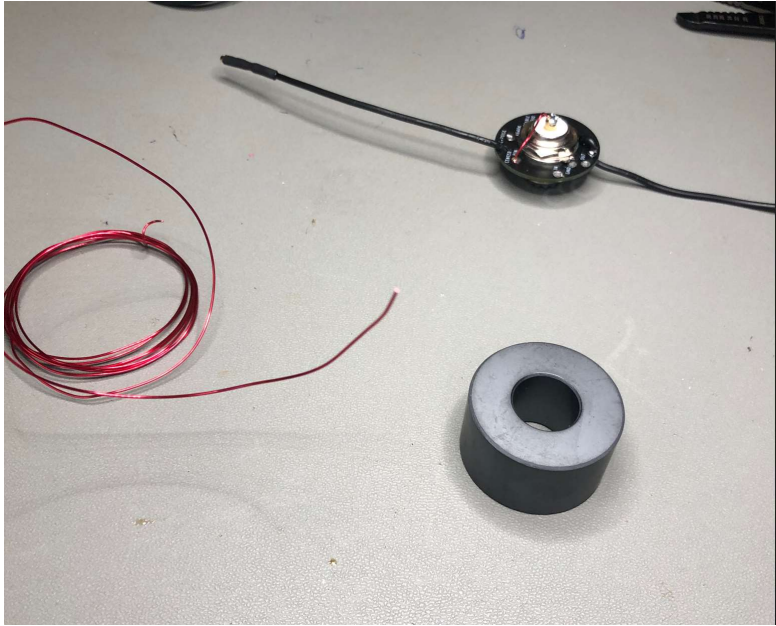


Build Kit – Wind Coil

- Continue with 14 turns

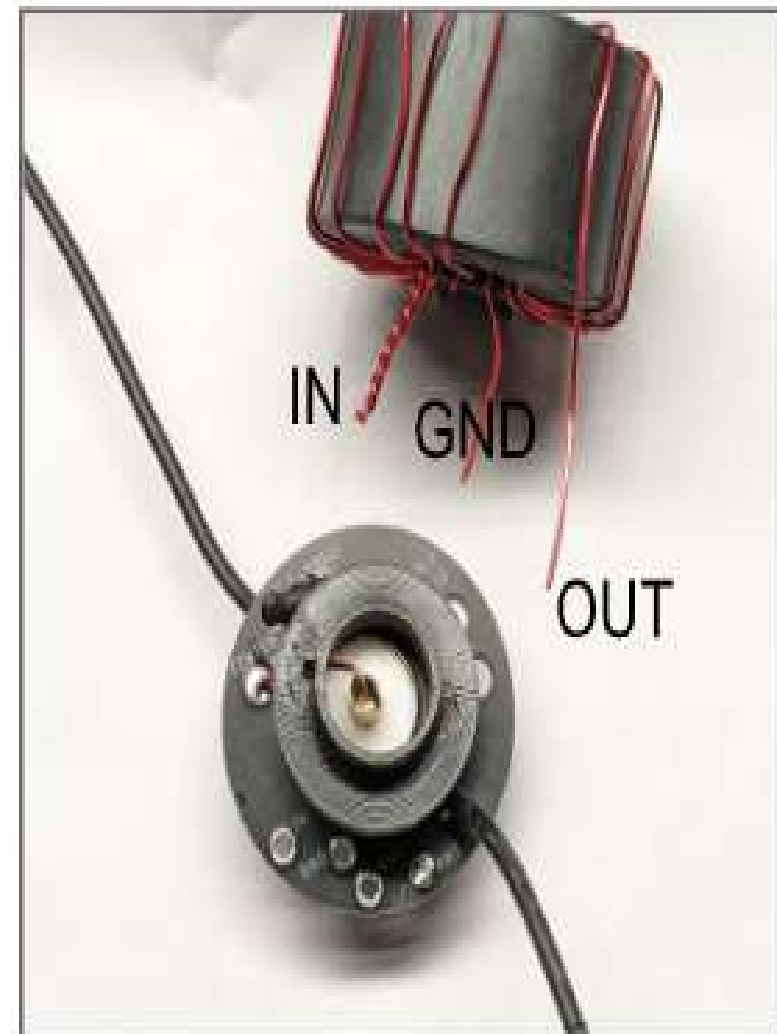


Build Kit – Wind Coil



Build Kit – Wind Coil

- Cut then strip enamel
- Align to PCB
- Be sure Spacer in on!



Build Kit – Wind Coil

- Solder to PCB



Build Kit – Strain Relief Cord

- Add strain relief cord



Build Kit – Test!

- Connect 2450 ohm
- Sweep to test



Build Kit – Heat Shrink



Test – Sweep with Half Wave

- We will connect the antenna wire
- Measure resonant freq
- Fold antenna wire back at end to tune
- Actual setup tuning will vary

EFRW – End Fed Random Wire

The EFRW should be built following the EFRW build instructions on the K6ARK site, but using the large ferrite and with the coil specified below-changes in RED.

Uncoil the magnet wire. Start with the end of the wire in the center of the toroid and begin winding as shown in the image to the right. Make **6** full turns, evenly spaced around the toroid. The starting end of the wire will solder to the "GND" pad on the PCB.



As you reach the position of the end of the wire, make a small stub by twisting the wire as shown to the right. Position the twisted stub toward the outside of the toroid. This will connect to the "IN" pad on the PCB.



Continue winding the remaining wire around the toroid next to the previous turns another **12** turns, making two full laps around the toroid as shown in the image to the right. Finish just



EFRW – End Fed Random Wire

The EFRW should be built following the EFRW build instructions on the K6ARK site, but using the large ferrite and with the coil specified below-changes in RED.

Uncoil the magnet wire. Start with the end of the wire in the center of the toroid and begin winding as shown in the image to the right. Make **6** full turns, evenly spaced around the toroid. The starting end of the wire will solder to the "GND" pad on the PCB.



As you reach the position of the end of the wire, make a small stub by twisting the wire as shown to the right. Position the twisted stub toward the outside of the toroid. This will connect to the "IN" pad on the PCB.



Continue winding the remaining wire around the toroid next to the previous turns another **12** turns, making two full laps around the toroid as shown in the image to the right. Finish just



EFRW – End Fed Random Wire

