MY ANTENNA JOURNEY

SO FAR!

- JOHN AC9UV

THE JOURNEY

- Beginnings Halcrafters sx-110 , electronics dabling
- High School Ham Radio Club
- IIT EE => CS with micro-computers
- Climbing buddy was a QRP/CW ham
- Technician license Heath Kit HW-101->10m X beam
- Retired, then Tech->General->Extra ->ICOM-707

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REGAINED LICENSE ---->EXTRA

- Rebuilt 10M X Beam (article)
- Found shorter 40m ant. for limited space (book)
- 2m ground plane for York 2m Mon. night net (book)
- 6m Squalo because 7300 has 6m. (youtube)
- Off Center Dipole (Youtube?)

FIELD ANTENNAS

- Off Center Fed Dipole (for field day)
- 2m, 7cm handheld yagi
- Double Delta (for field day)
- Multi band no tune End Fed (transformer)
- 3 band trapped End Fed Stealth Antenna
- Tape Measure Antenna with Multi band no tune

TECH LICENSE, 10M PHONE

- 10M FOR $10 ARTICLE
- Solar Cycle 23 peaked in 2001
- Contact SSB with Sydney Australia 100w HW-101

Build a high performance, 10 meter beam for $10.

by Michael Harris KM4UL

I have always enjoyed home-brewing ham radio equipment, and especially antenna projects, because the components are relatively inexpensive and the results are tangible. My wife says that I build and tinker more than I operate. Guilty as charged!

This article is a result of my tinkering, good performance and appeared to be relatively easy to construct. The article discusses design, construction, and tuning in general, but does not focus on a particular design. I picked up the ball from there and the result is an operational X-beam, a regular schedule with Robin, and this article, an explanation ing of this antenna using MININEC3 (J.C. Logan and J.W. Rockway, *The New MININEC, Version 3: A Mini-Numerical Electromagnetic Code*, NOSC Technical Document 938, National Technical Information Service, 1986). This modeling confirms the gain figures reported by Brice, the effec-

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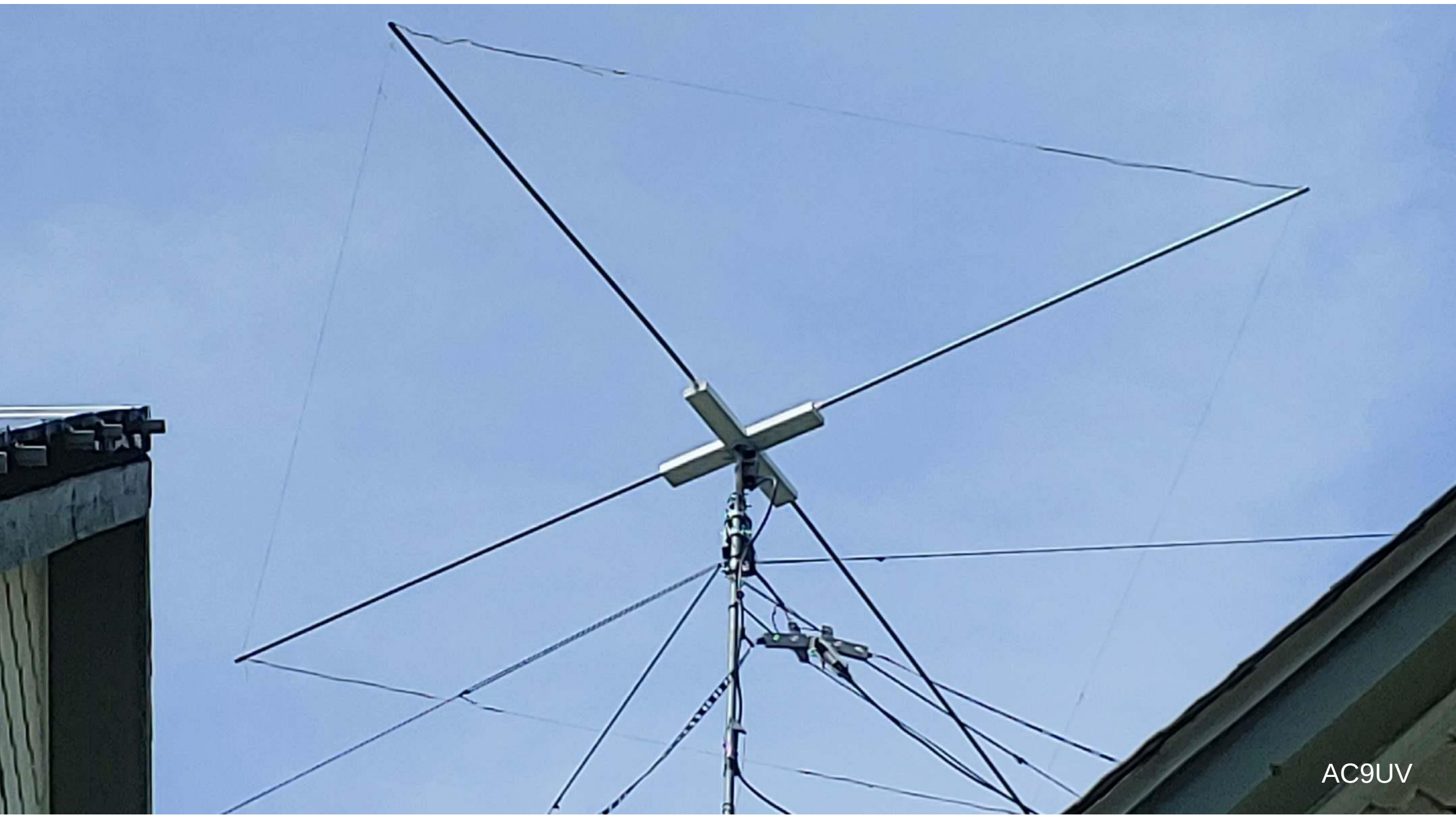
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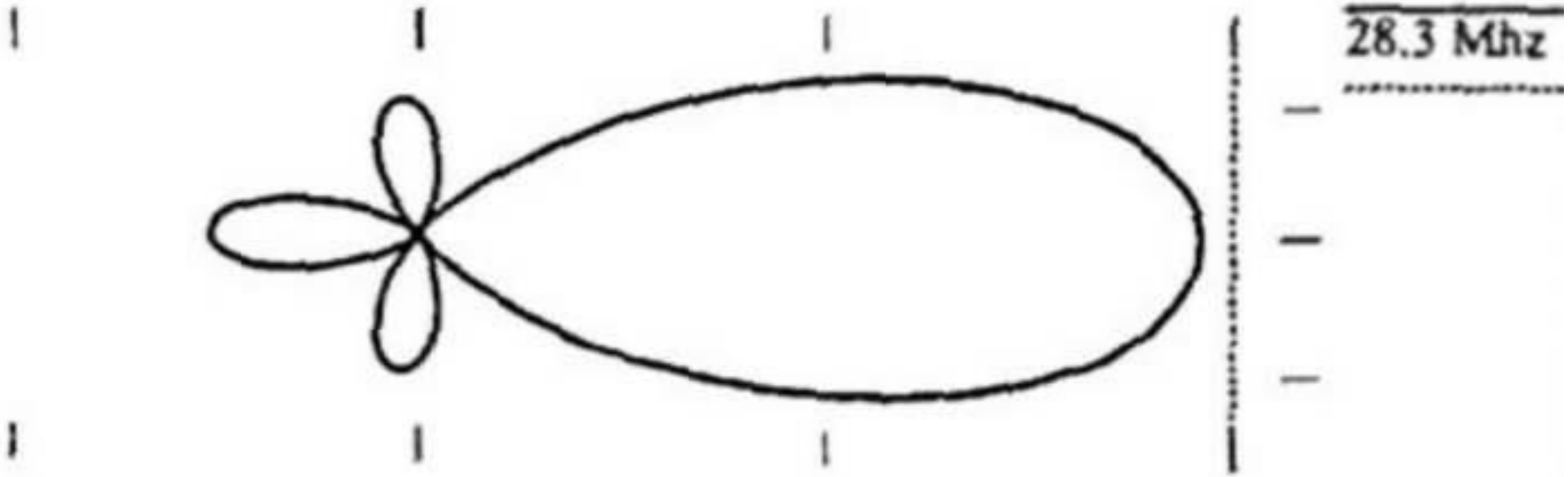

Figure 5. X-beam pattern.

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10m Beam Parts List

Parts List

4	10′ lengths of ½″ EMT conduit
1	10′ length of ½″ SDR PVC pipe
12	½″ plumbing pipe clamps
1	8″ length of silicon tubing
4	4′ lengths of wire scraps
2	24″ lengths of pressure-treated two-by-four
6	50″ lengths of coax (RG-8X preferable)
	Misc. Hardware as required

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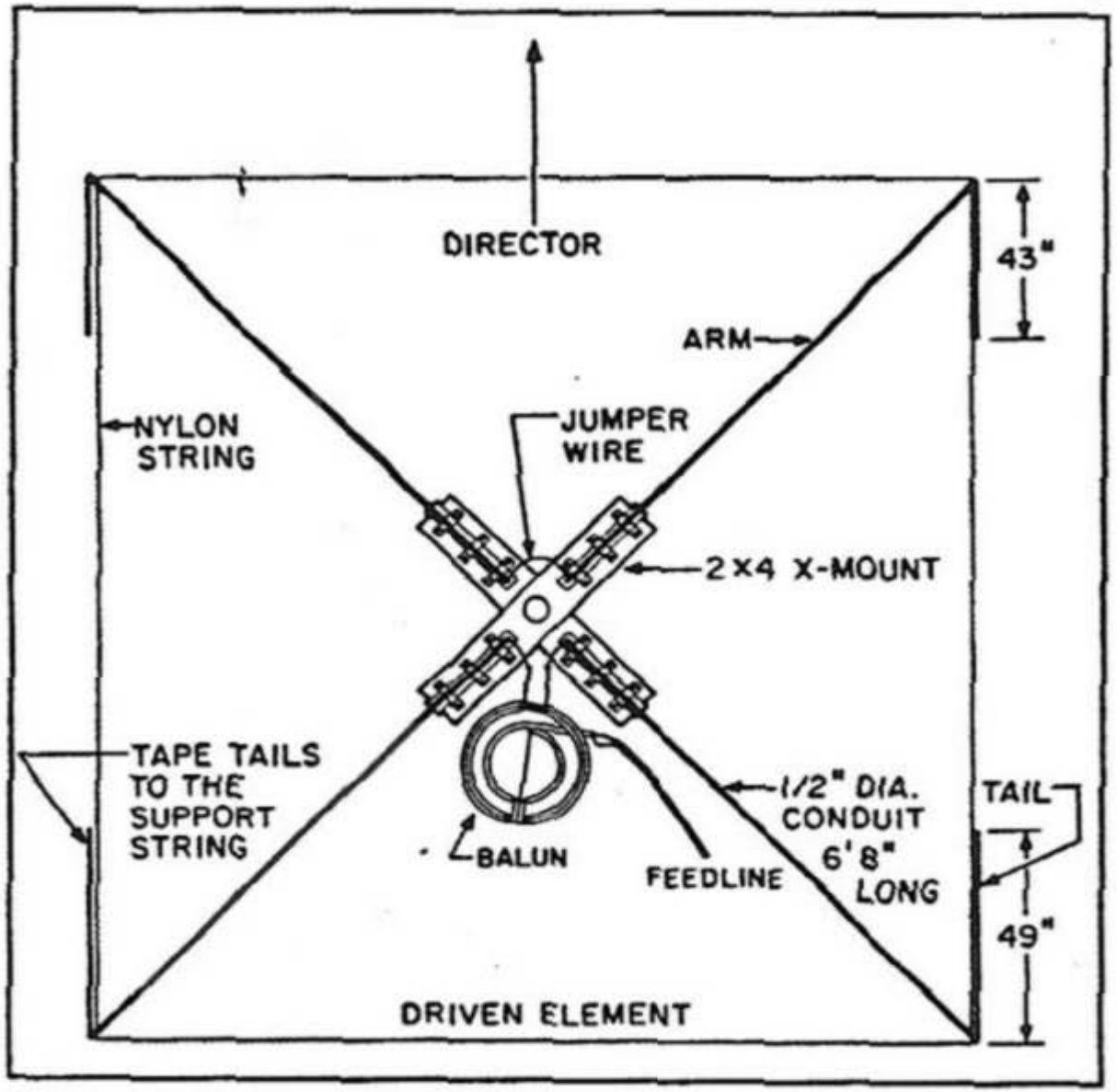

Figure 1. X-beam overview.

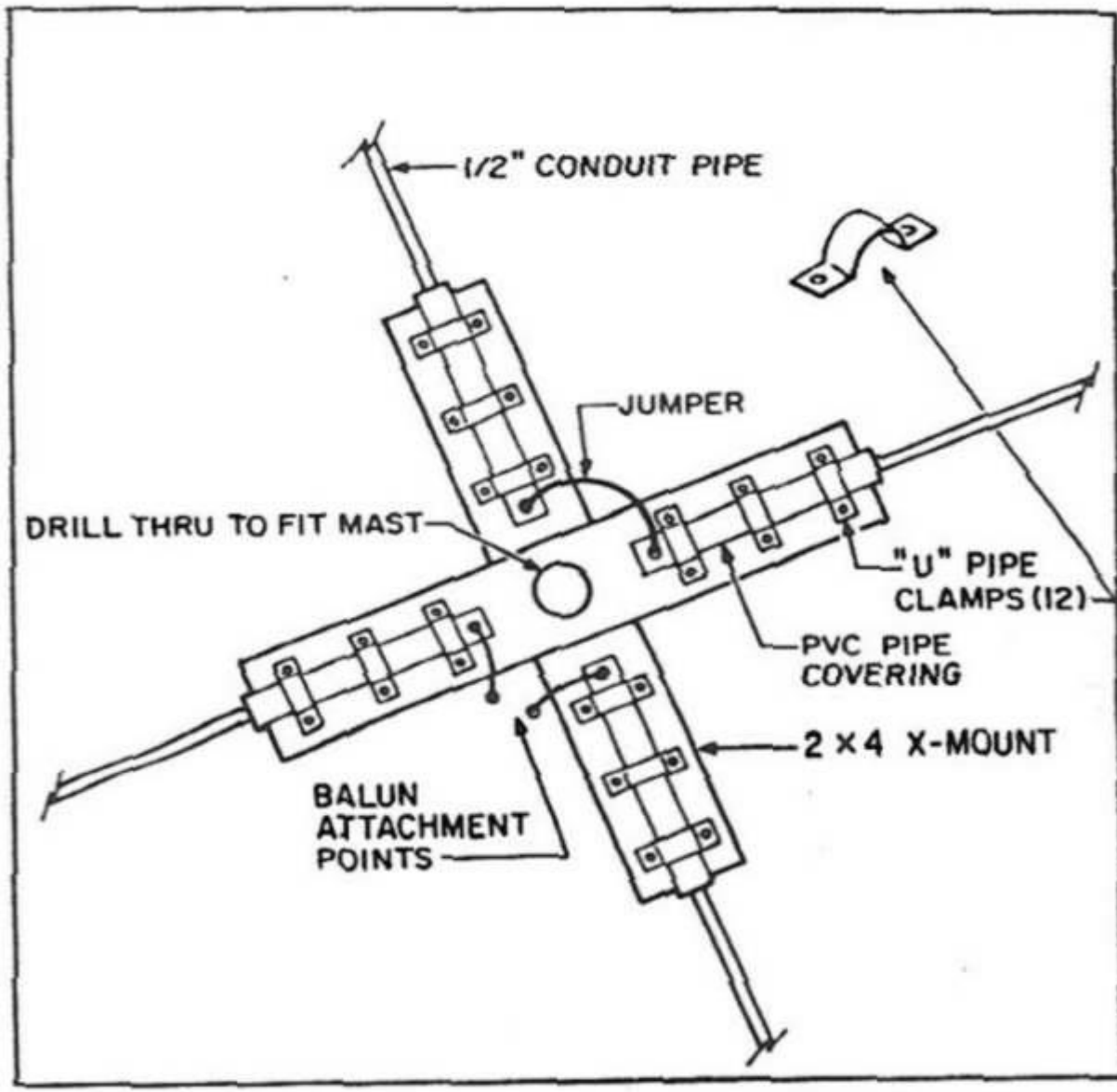

Figure 3. X-mount construction details.

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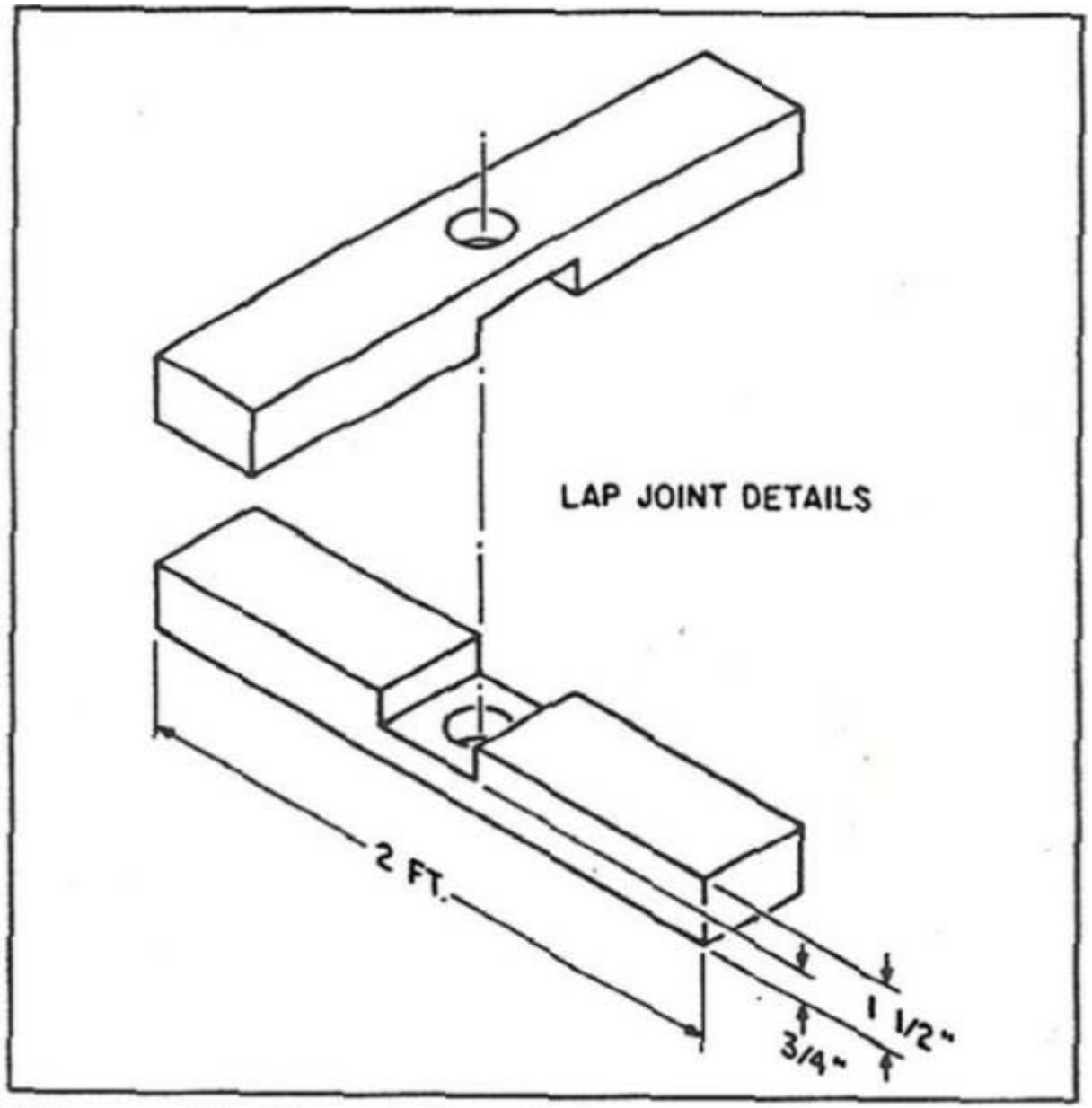

Figure 2. Lap joint for assembly of the X-mount.

Parts List

4	10′ lengths of ½″ EMT conduit
1	10′ length of ½″ SDR PVC pipe
12	½″ plumbing pipe clamps
1	8″ length of silicon tubing
4	4′ lengths of wire scraps
2	24″ lengths of pressure-treated two-by-four
6	50″ lengths of coax (RG-8X preferable)
	Misc. Hardware as required

```
Lowes as of 5/27/2022

conduit emt 1/2in 10foot  Lowes  $6.98/per 27.92
pvc sdr charlotte pipe 10ft lowes $5.53
1/2 in pipe clamps 10 pack  $3.25/10 12 would be $3.90/12
8 ft pressure treated 2-4  $6.78   would need $3.39
DX Engineering 50ft rg-8x 50ft  $52.99
DX engineering 1:4 balun $149.99
Make your own from plans .48/ft  maybe 6ft  $2.88

total:  $43.62 for XBeam and balun.
```

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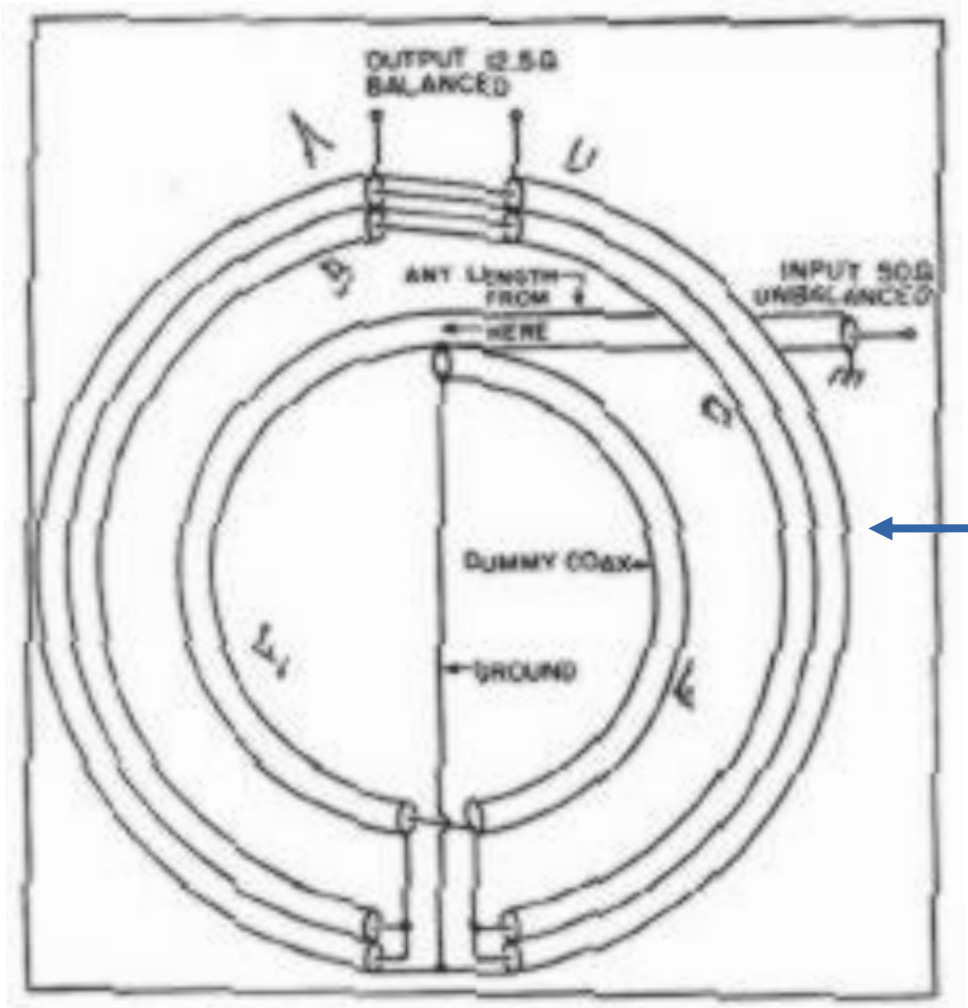

Figure 4. Collins balun.

The Xbeam has 12.5 ohm impedance which means you need a 4:1 BALUN to match 50 ohms

From the article, a 4:1 BALUN design

I chose a commercial 4:1 BALUN, more compact and Less exposed to the elements

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SWR 2.07
1.38
1: 28.300 000 MHz
START 10.000 000 MHz
STOP 49.999 999 MHz
NanoVNA

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SWR 2.07
1.38
1: 28.300 000 MHz
START 10.000 000 MHz
STOP 49.999 999 MHz
NanoVNA

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I priced out the project at today's prices

Lowes as of 5/27/2022

conduit emt 1/2in 10foot Lowes $6.98/per 27.92
pvc sdr charlotte pipe 10ft lowes $5.53
1/2 in pipe clamps 10 pack $3.25/10 12 would be $3.90/12
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DX engineering 1:4 balun $149.99
Make your own from plans .48/ft maybe 6ft $2.88

total: $43.62 for XBeam and balun.

10 meter Xbeam with a Radio Shack antenna rotor has been a staple of my Antenna arsenal from the beginning

With the Solar Cycle on the upswing it will only get better.

Sometime I'll upgrade to a better antenna rotor that keeps good track of the current direction more accurately.

The large size is much more visible than say a vertical. If you have a HOA then it may not be a choice (since 2016 HOA can prevent Hams from putting up antennas, before that they could not restrict us because we were an emergency service)

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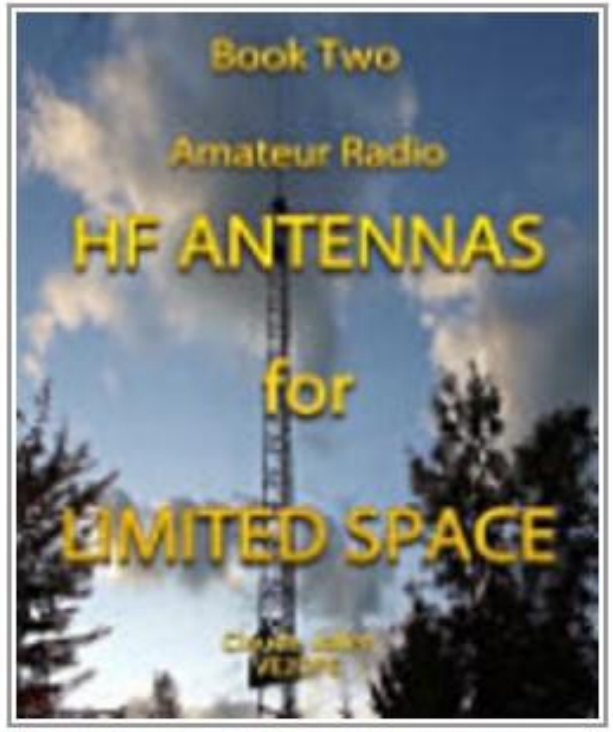
40m Folded Dipole

Limited Space!!! What to do?



Amateur Radio HF …
Claude Jollet, VE2…

Claude Jollet VE2DPE

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Linear-Loaded Short HF Dipole

For many amateur radio operators, it is not feasible to put up a full-length dipole on HF.

But linear-loading a dipole just might fit into your available space! A linear-loaded dipole, as illustrated below,

- is about 30-35% shorter than a “classic half-wave dipole” at the same frequency of resonance;
- has a radiation resistance around 35 Ohms (will require an impedance matching tuner);
- is just as effective as a “full-length” half-wave dipole!

It is possible to calculate the approximate length of the antenna using the formula below:

$$\text{length (metres)} = \frac{150\ \text{A}}{f}$$

$$\text{length (inches)} = \frac{5905\ \text{A}}{f}$$

The factor "A" is largely dependent upon the length / diameter ratio and for HF antennas it is often around 0.95 to 0.98.

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Here are the dimensions you should start with for each HF amateur radio frequency band:

- 10 M (28.5 MHz) 3.5 m (11.5 ft)
- 12 M (24.9 MHz) 4.0 m (13.2 ft)
- 15 M (21.1 MHz) 4.73 m (15.5 ft)
- 17 M (18.1 MHz) 5.51 m (18.1 ft)
- 20 M (14.1 MHz) 7.08 m (23.2 ft)
- 30 M (10.1 MHz) 9.89 m (32.44 ft)
- 40 M (7.1 MHz) 14.06 m (46.14 ft)
- 80 M (3.6 MHz) 27.74 m (91.0 ft)
- 160 M (1.85 MHz)53.97 m (177.08 ft)

Nice!!!!

Table for folded dipole length

Claude Jollet VE2DPE

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A table of the lengths for the HF amateur radio bands is shown below:

For Full Length half wave

APPROXIMATE LENGTHS FOR HF HAM BAND DIPOLE ANTENNAS

BAND (MHZ)	LENGTH (FEET)	LENGTH (METRES)
1.8 (160 metres)	266	82.2
3.5 (80 metres)	137	42.2
7.0 MHz (40 metres)	68.5	21.1
10.1 (30 metres)	47.5	14.7
14.00 (20 metres)	34.3	10.6
18.068	26.6	8.2
21.00 (15 metres)	22.8	7.04
24.89	19.3	5.94
28.00 (10 metres)	17.1	5.28

Because!!!

We save 22 ft. !!!

electronicsnotes
Incorporating Radio-Electronics.com

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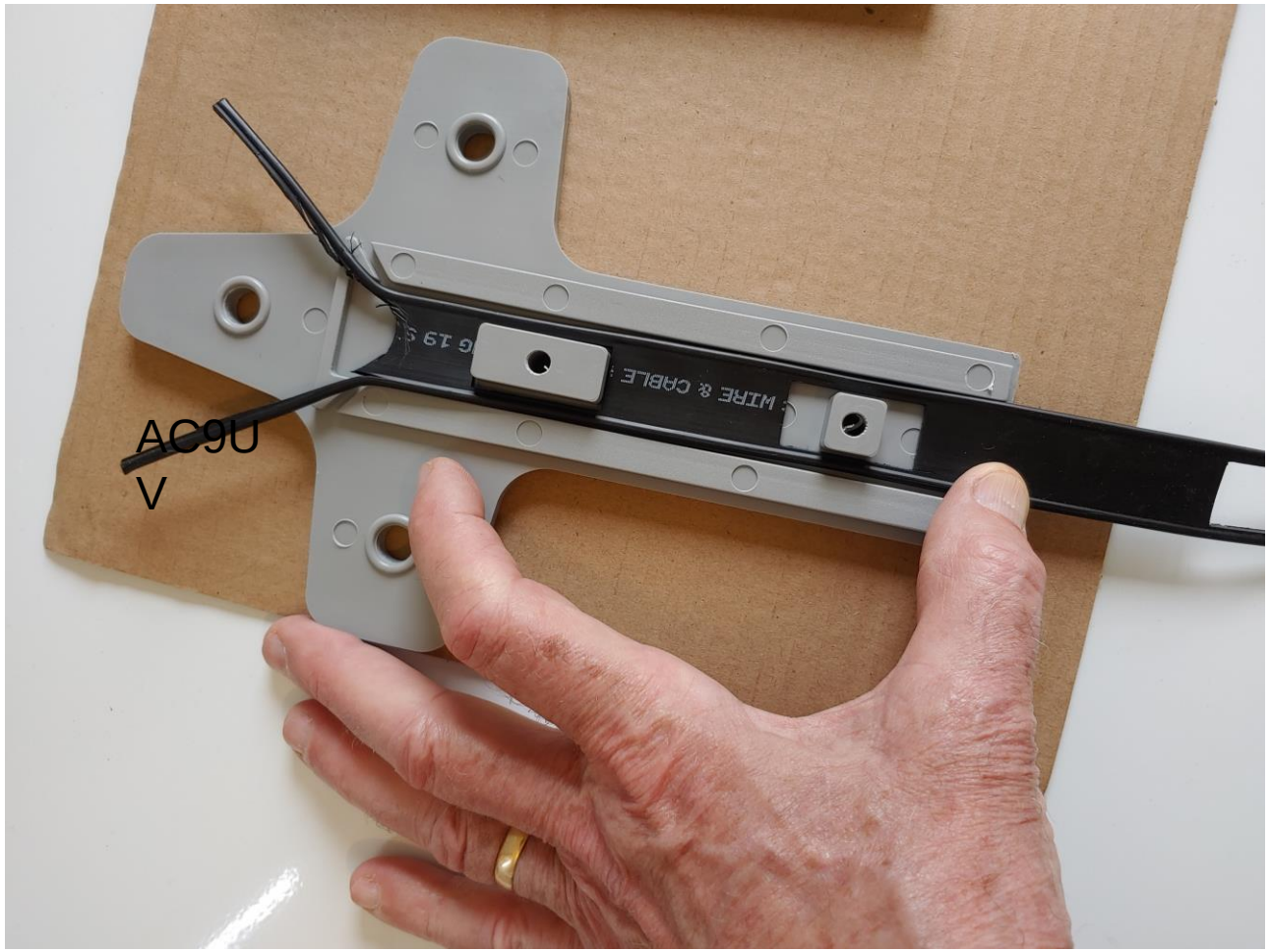
Ladder Lock(R) Holderss, use 3 for center feed point



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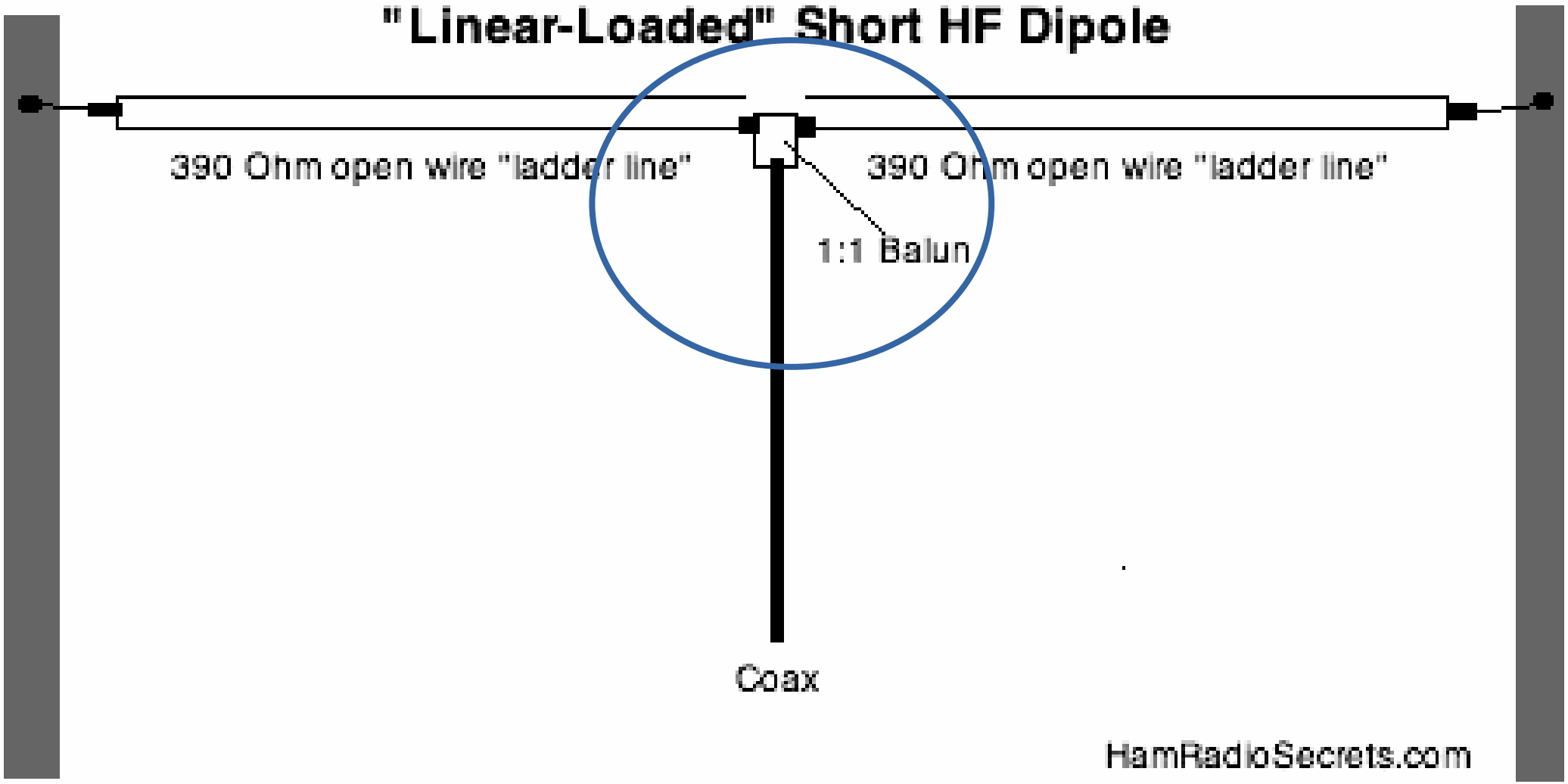

1:1 Balun Choice from Ham Radio Secrets

2 Ladder Line holders and balun

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2 Ladder Loc® and Balun

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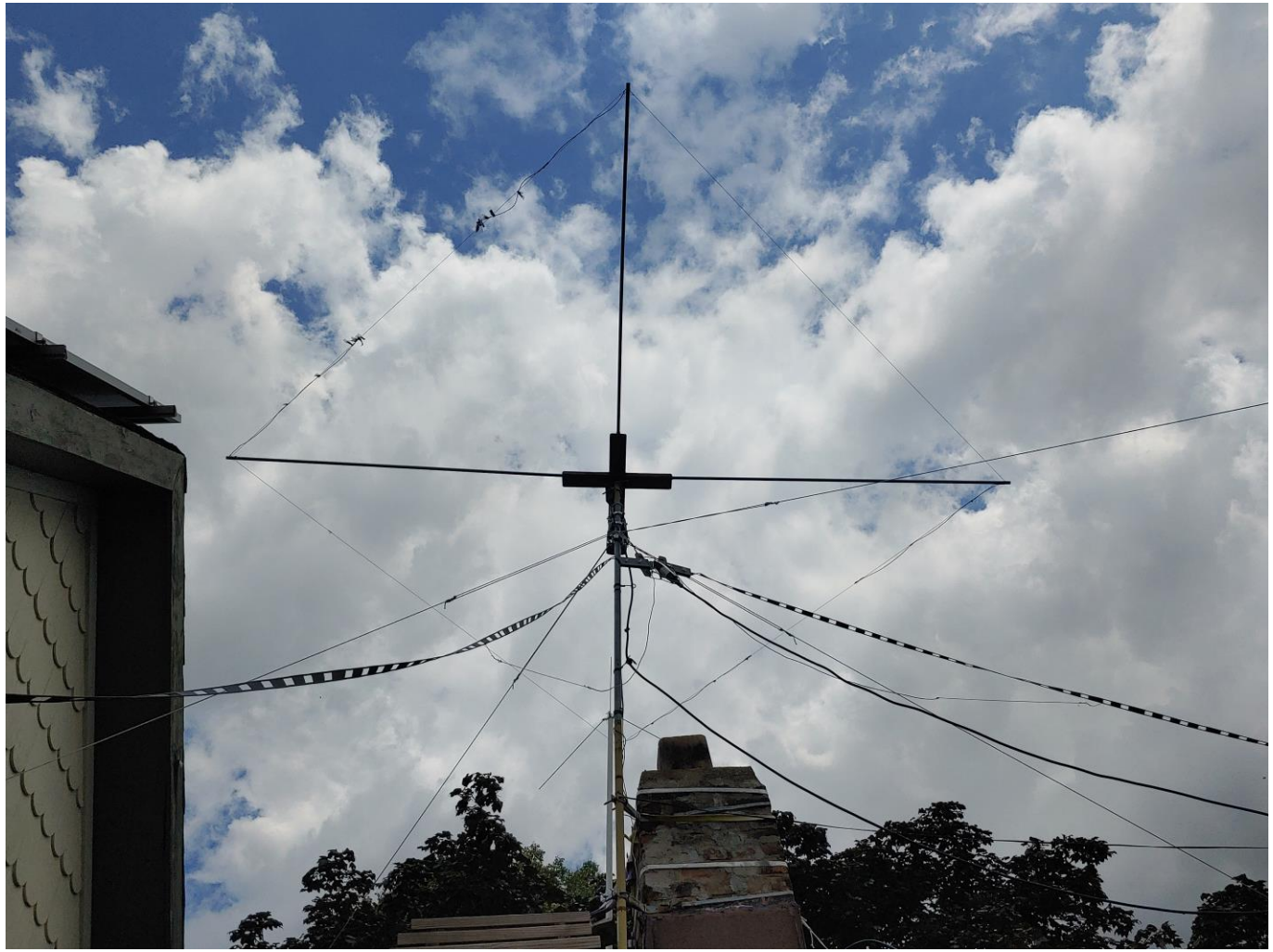
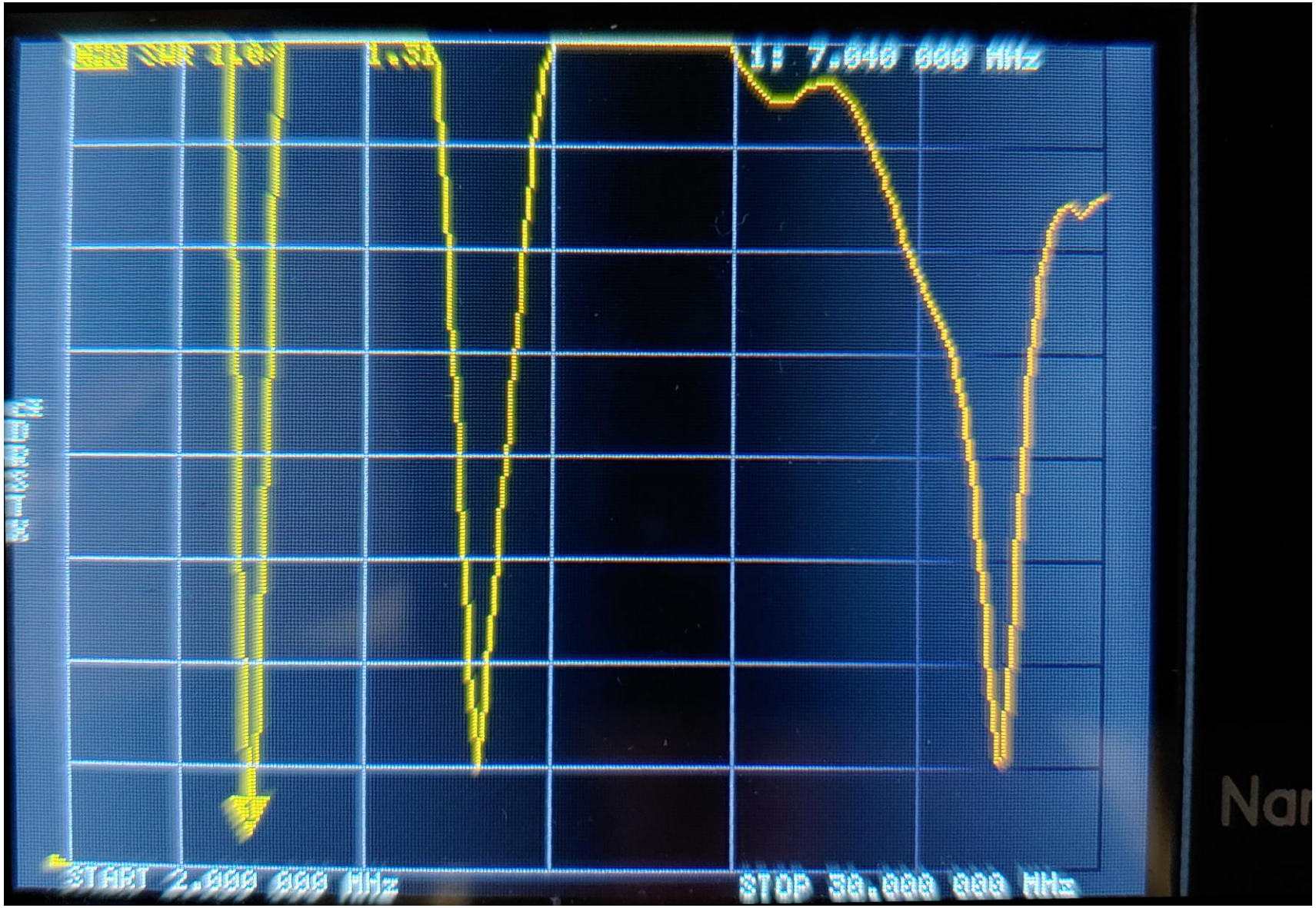
Folded Dipole in place before and after ends fastened





Folded 40m Dipole – 40m SWR dip (untuned)

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Folded 40m Dipole – 20m SWR dip (untuned)

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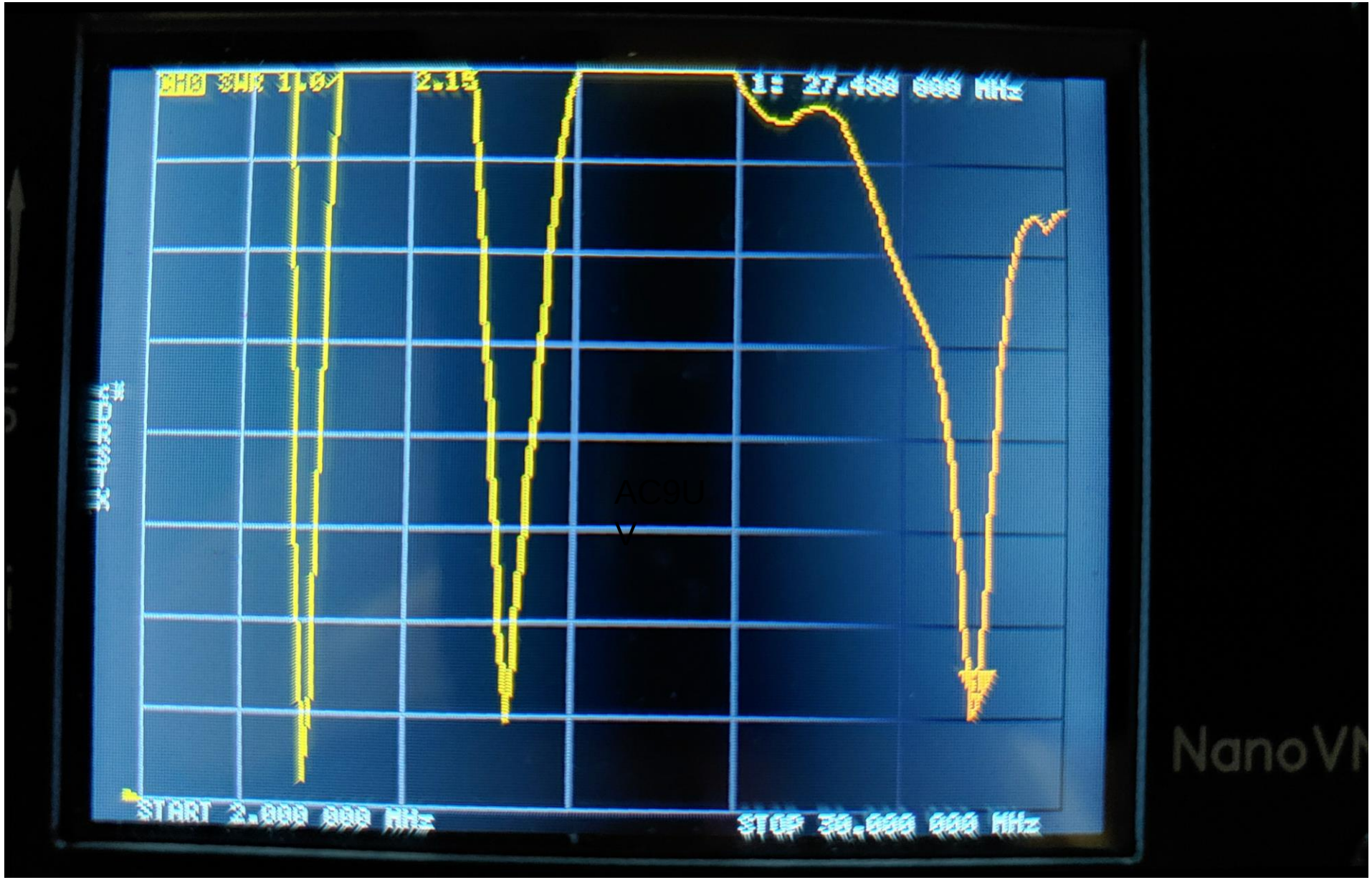

Folded 40m Dipole – 10m SWR dip (untuned)

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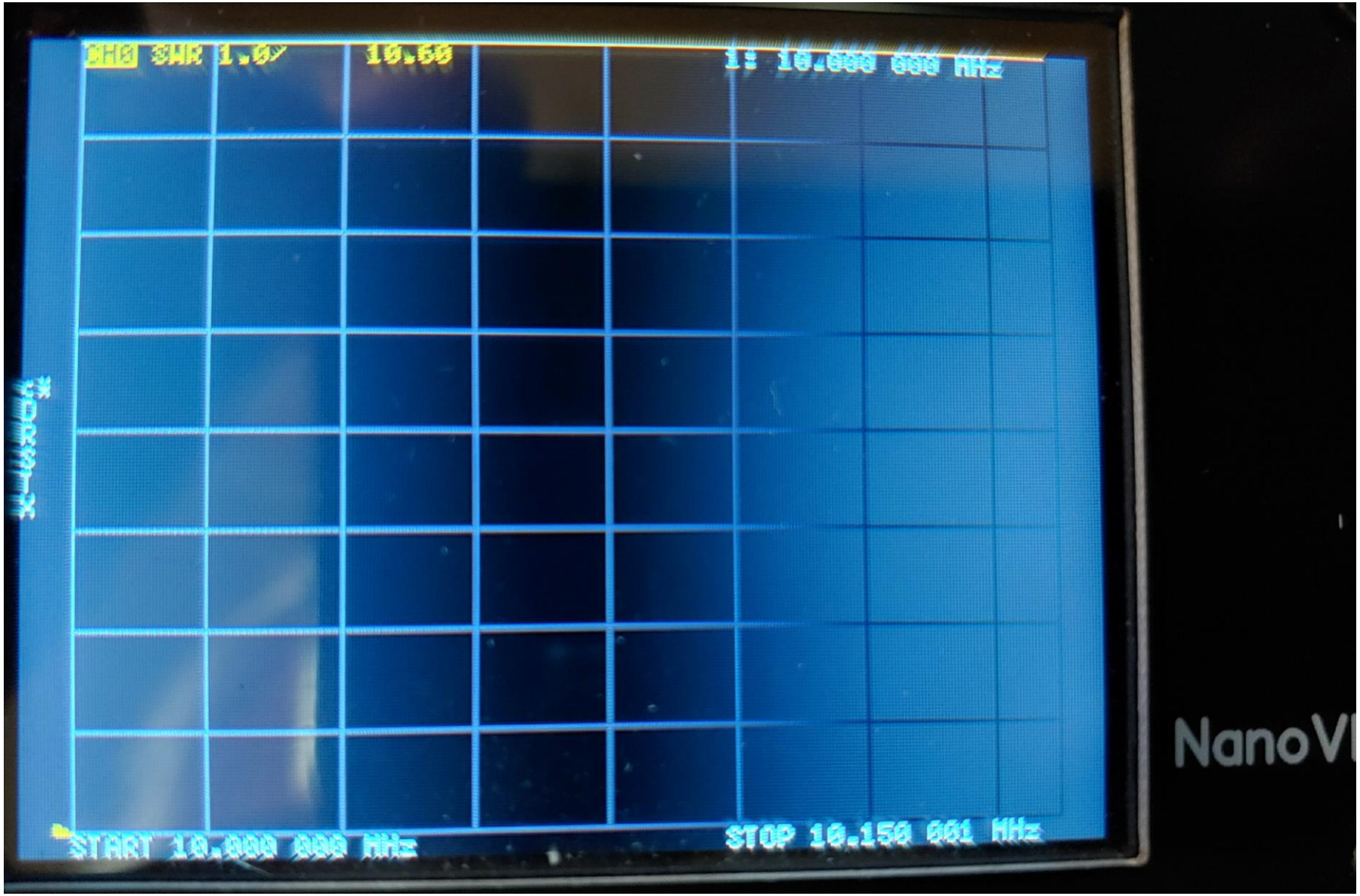

Folded 40m Dipole – 30m SWR (untuned)

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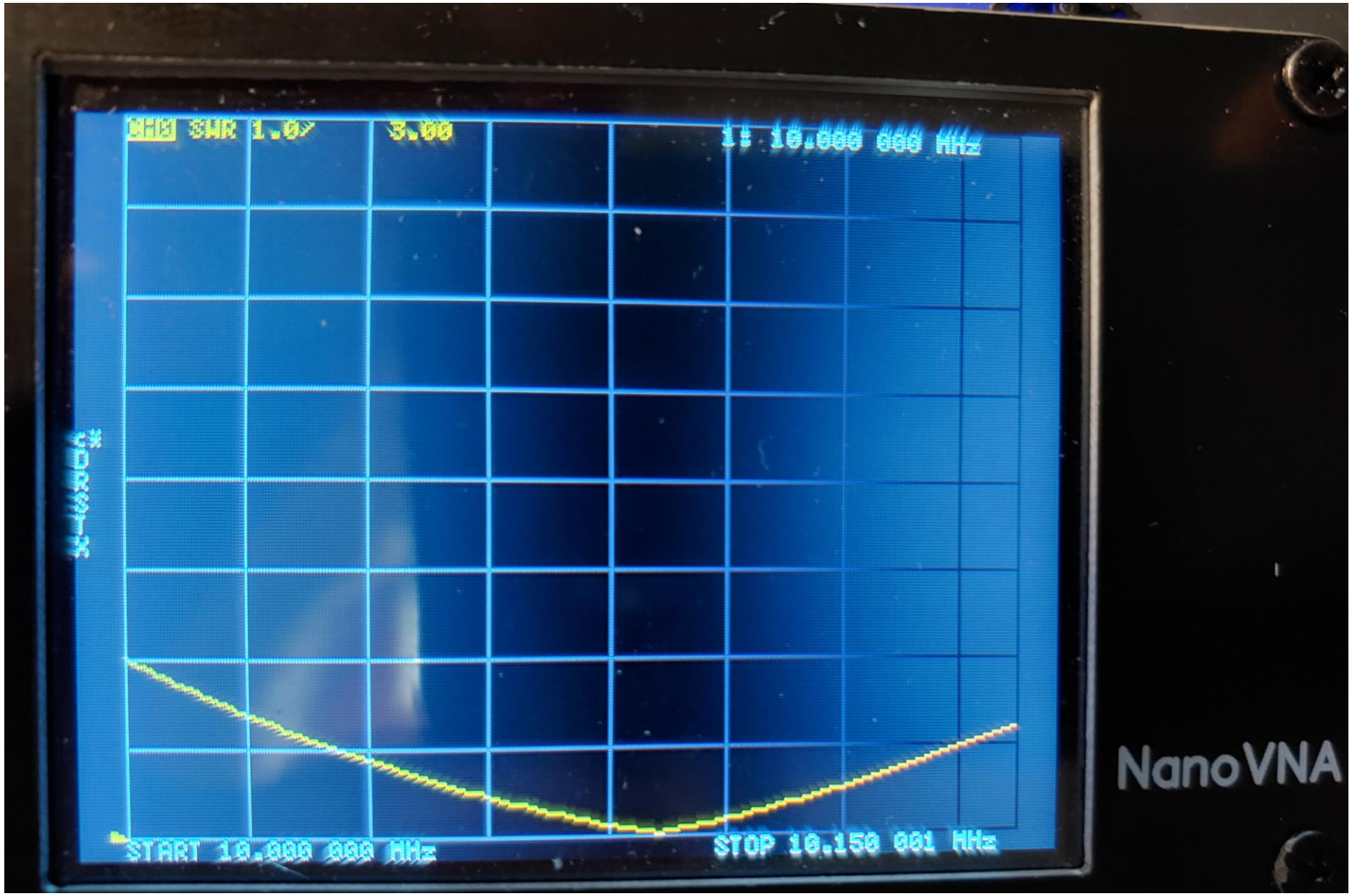

Folded 40m Dipole – 30m SWR dip (tuned)

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With tuner, good SWR available on bands from 80m to 10m (but use X beam for 10m)

With the exception of 30 meters is a tricky tune.

It is my go-to HF Antenna.

I like the analog tuner dials vs. tuner in my IC-7300.

2m Ground Plane

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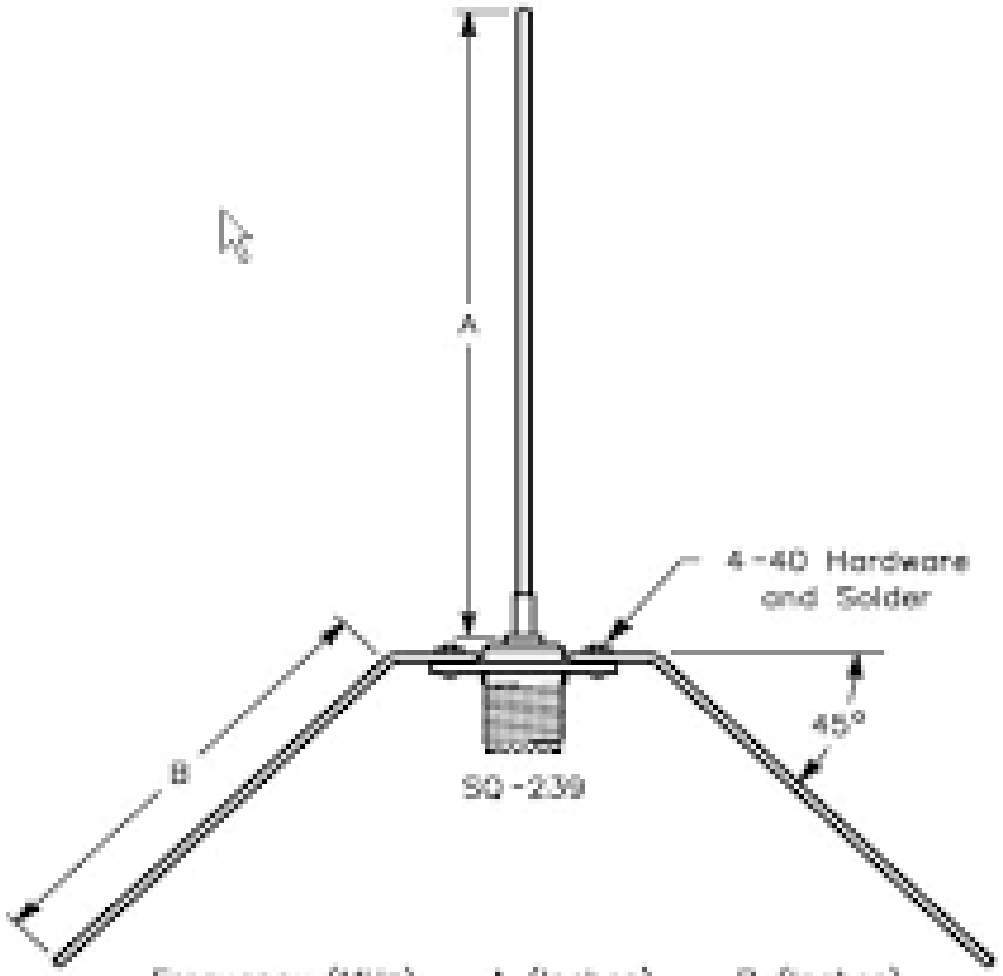


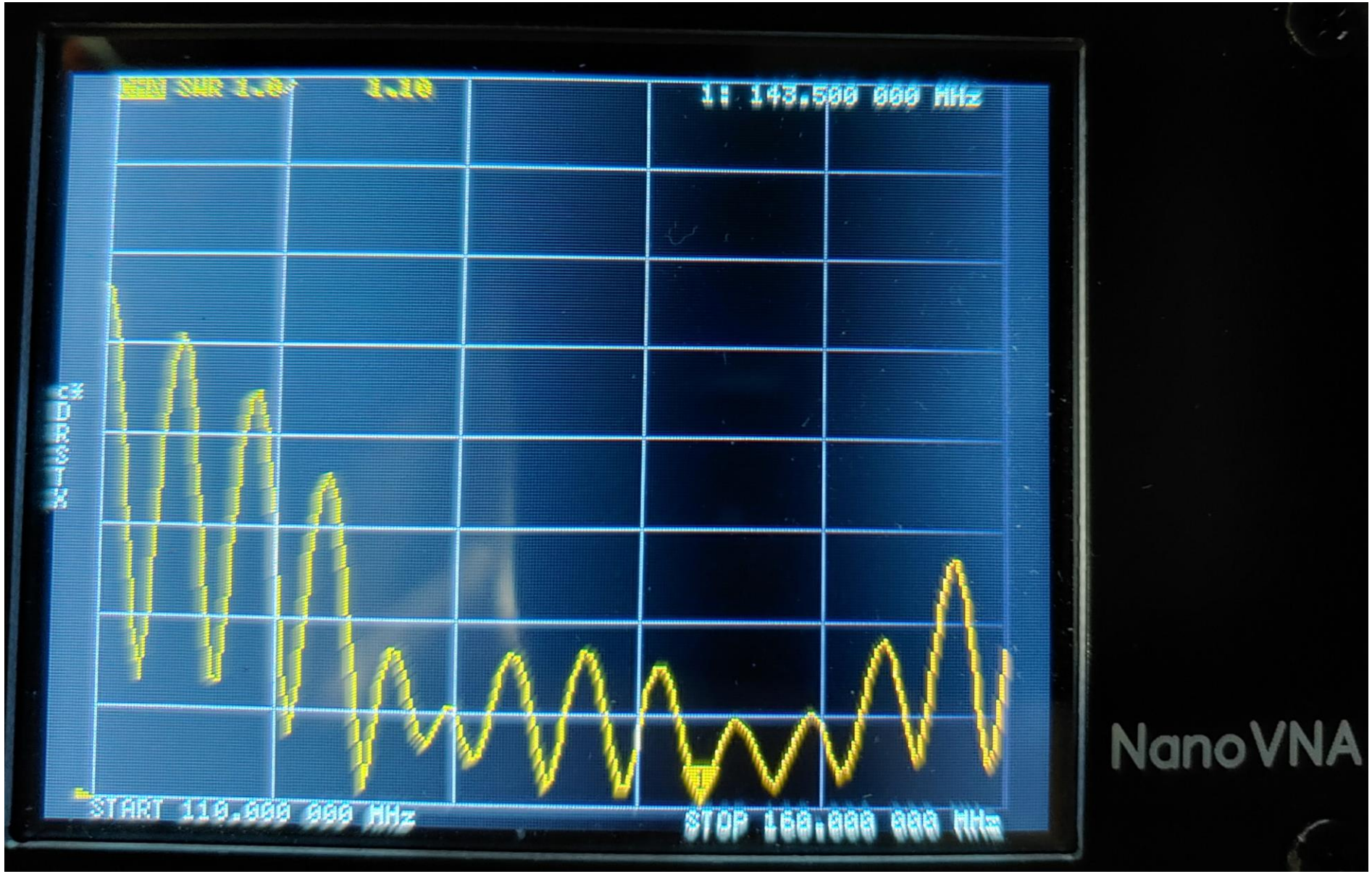
Frequency (MHz)	A (Inches)	B (Inches)
146	19-5/16"	18-11/16"
225	12-5/8"	12"
445	6-3/8"	5-3/4"

2M Ground Plane, Quick and easy!

Use SO-239 with 4 bent ground plane wires and one vertical wire

Fits into a (I think ½) PVC pipe with coax out bottom

A little over 19 in, vertical, a little less for ground planes



2m Ground Plain SWR profile (untuned)

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6m Squalo (square halo)

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Squalo antenna for 6m

ERNEST / 27 APRIL 2011 / ANTENNAS / 54 COMMENTS

Introduction

Adri PA0RDA, a friend of me, is trying to do some DX on 6m for a while now. His antenna position is very poor: he lives in the bottom flat of a 5-floor building. He has a balcony on the rear (south) side, but high buildings are very close, he has no direct sight in any direction. At the balcony he has a Diamond V2000 vertical antenna for 6/2/70, and an MFJ loop antenna for 15-40m. The 6m band is his most popular one, since he get best results on this band. However, since most DX on 6m is horizontally polarized, he needed a horizontal antenna. I remembered an all-direction horizontal antenna made by Jan PA3EGH (one of the members of the local radio club). So I contacted him, and he pointed me at his website. It was the "Squalo" antenna, or square halo. In fact, it's just a square folded dipole, originally designed by John KG4OSA. It radiates in all directions, with -4dB gain on the sides (compared to the front and back side).




Some Example of the 6m Squalo

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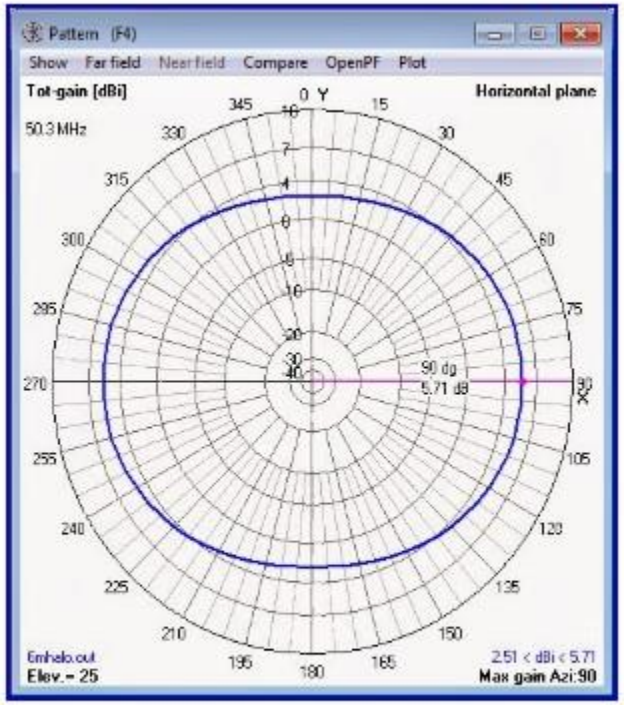
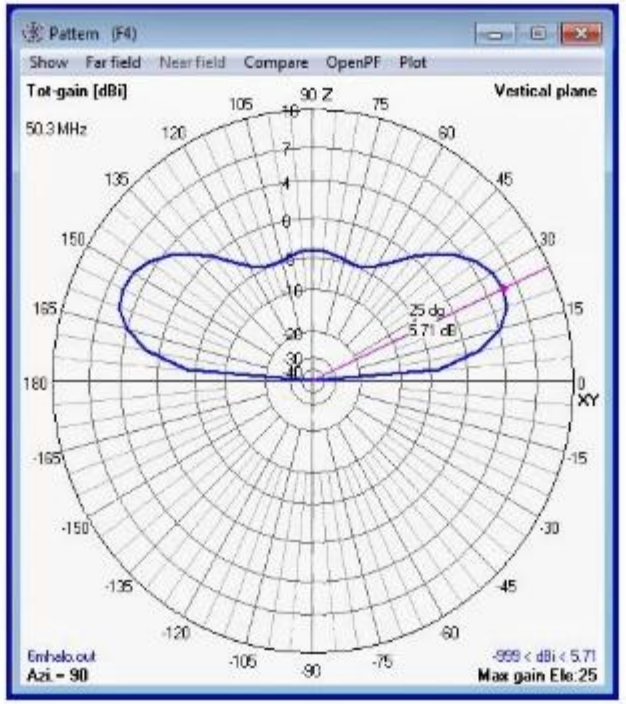
Halo Radiation Patterns (not Squalo)



26. 50 MHz Halo Antenna model - 4nec2 azimuth radiation pattern at 118 inches or 3 m (1/2 wavelength) height above simulated good ground.

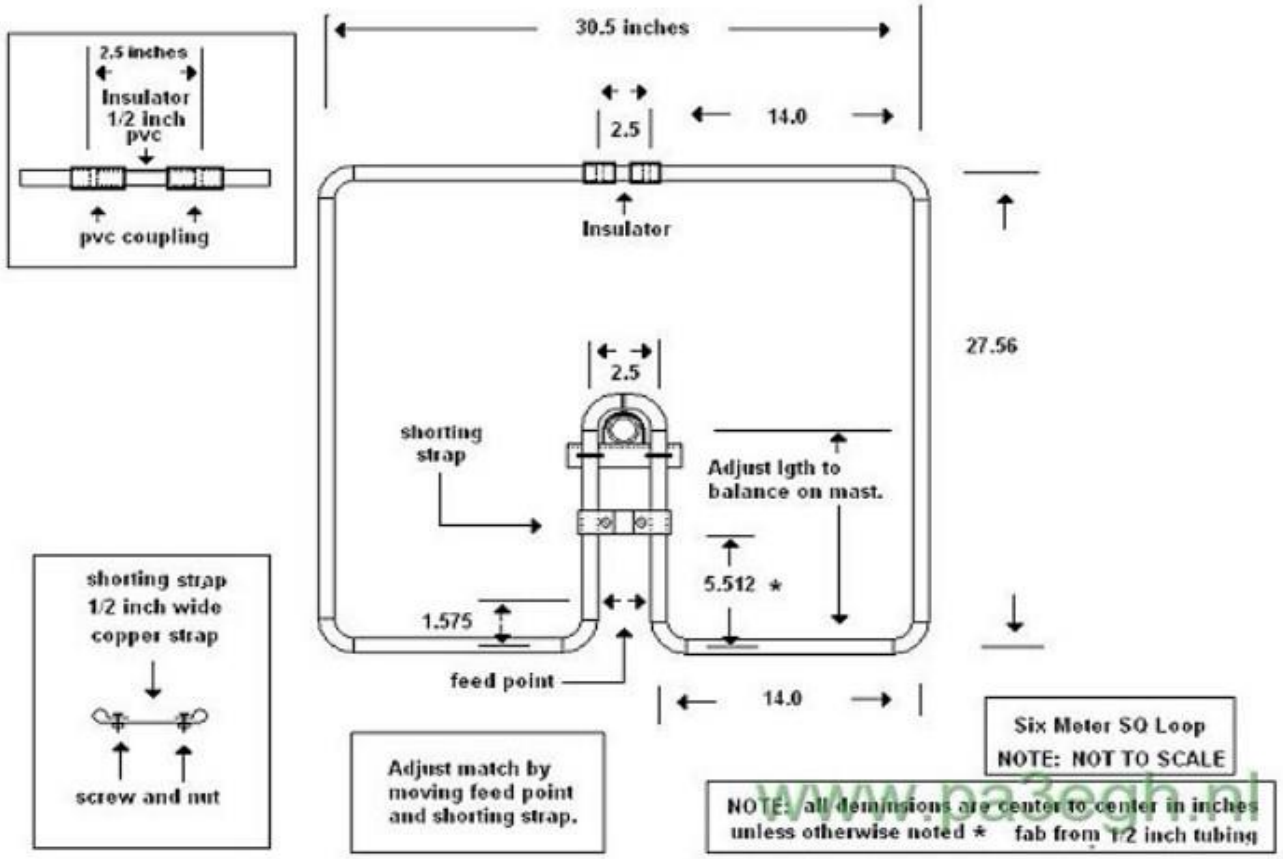


27. 50 MHz Halo Antenna model - 4nec2 elevation radiation pattern at 118 inches or 3 m (1/2 wavelength) height above simulated good ground.

by Dr. Carol F. Milazzo, KP4MD (posted 15 Mar 2014)
E-mail: kp4md@arrl.net

Construction

This is a copy of the design, originally published by Jan PA3EGH:



The original design. Please note that all measurements are center to center.

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My Construction

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On Tripod, on my Roof

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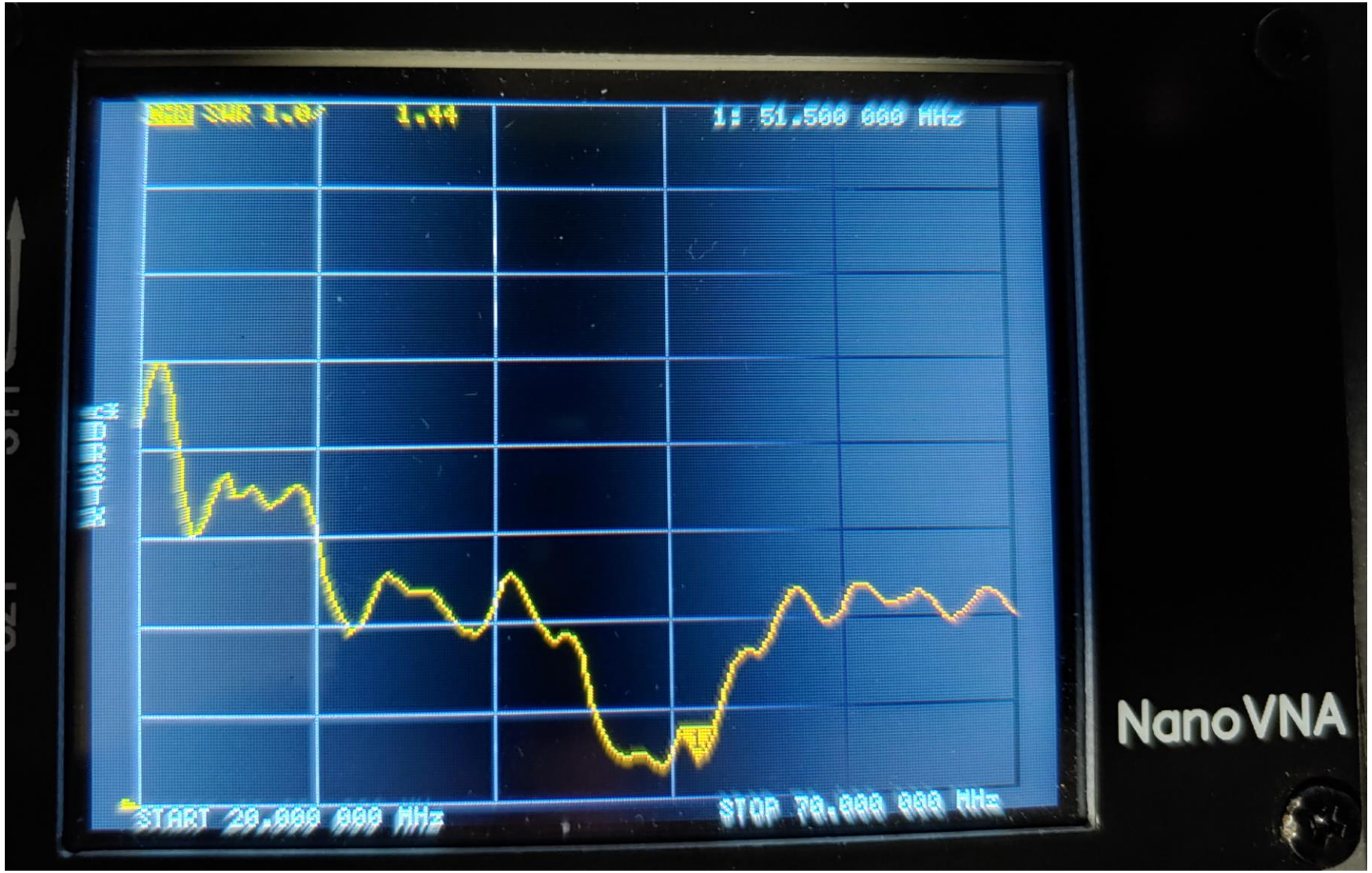

6m Squalo SWR profile (untuned)

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Squalo works

- Local contacts can be a problem
- Magic Band time.
- A few weeks ago, I could not hear the local net but made contacts with NJ and CT.

Off Center Dipole

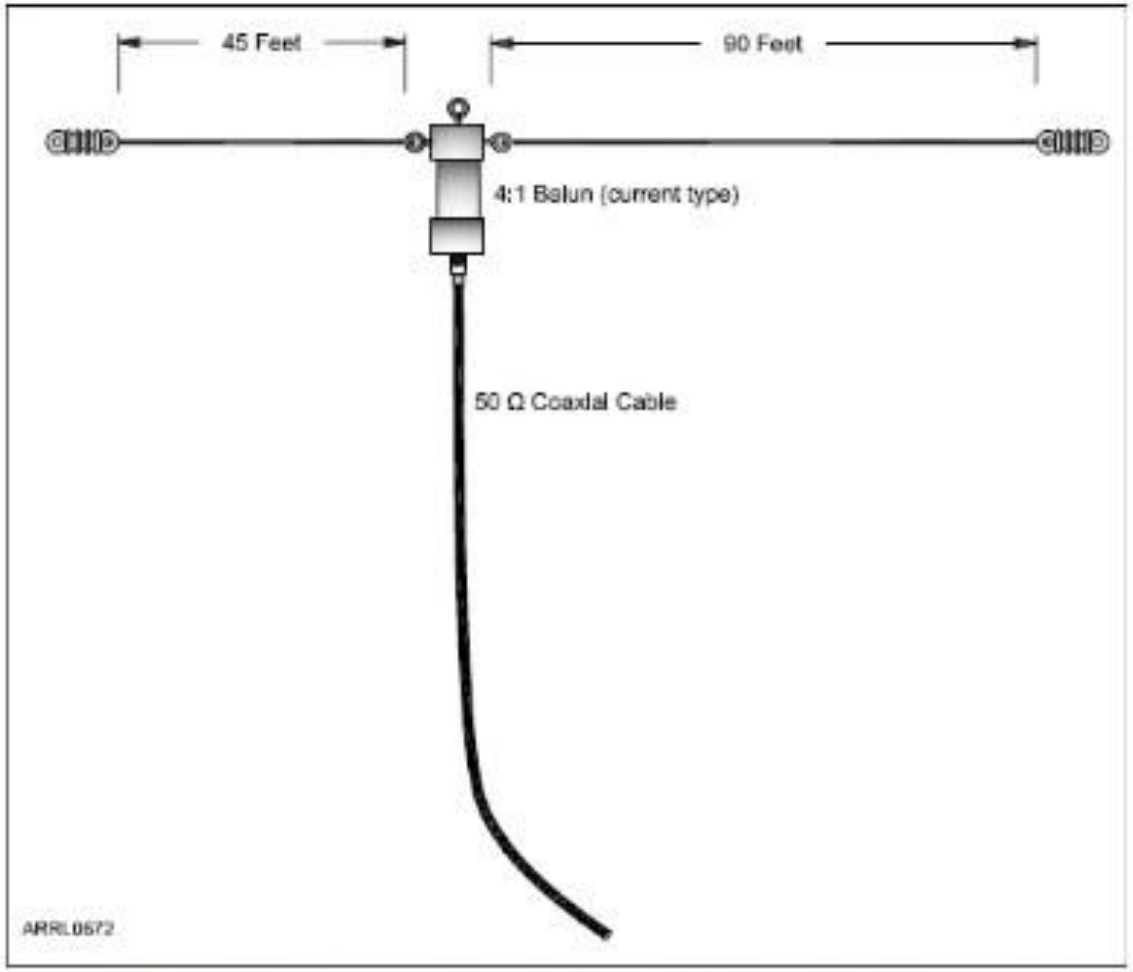
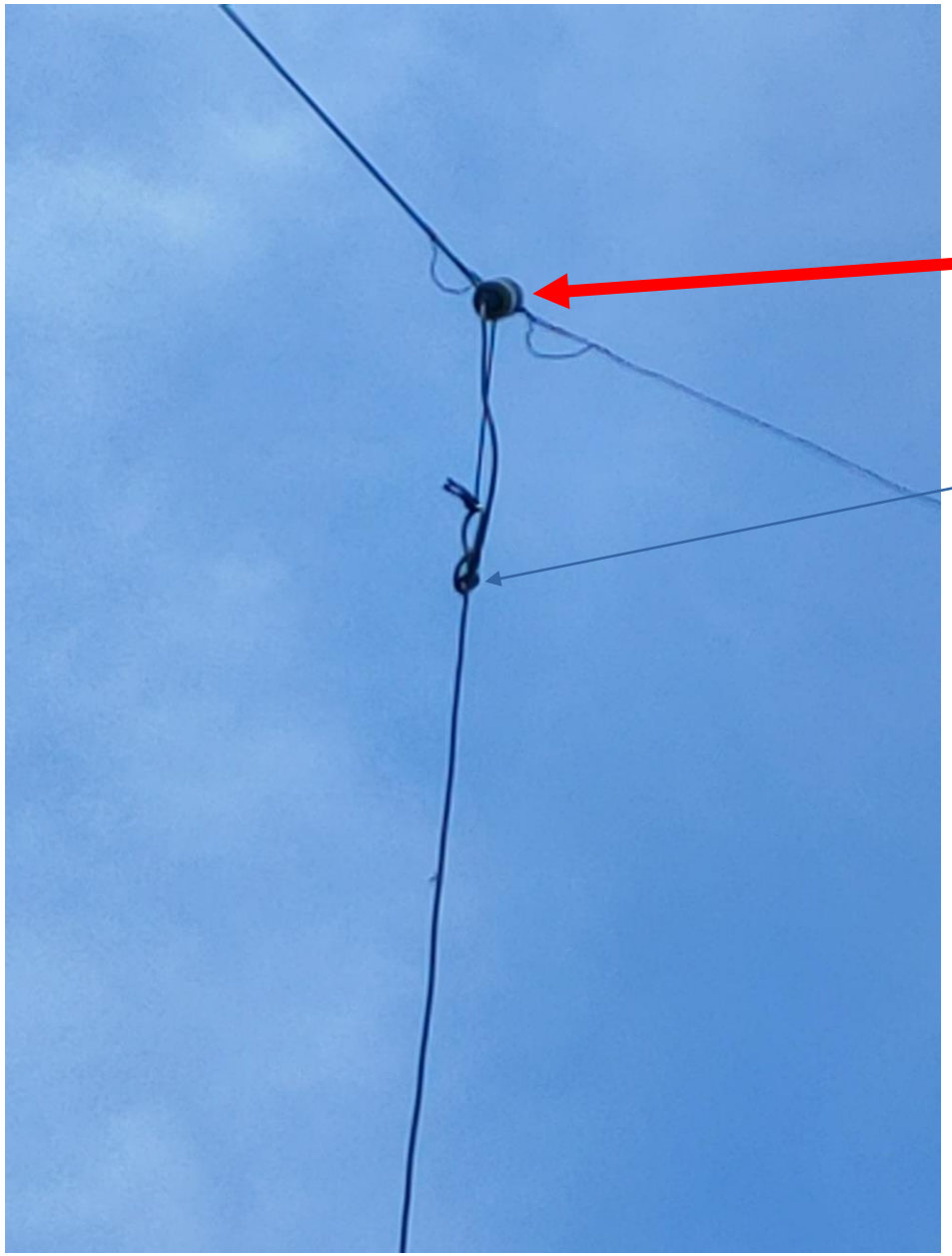


Figure 3.16 — In this example, we have an 80-meter Off Center Fed dipole with the feed point at ⅓ wavelength from the end.

- Originally created for Field Day 2019 or 2018
- Measured and tuned on the ground on step ladder height
- Ended up with about 11% - 89% ratio with good SWR on 40 and up
- 4:1 Balun
- Now in Indiana as main antenna, put up for Winter Field Day with CSRA Club
- Ron KD9IPO helped and used a slingshot to get it into the trees
- Extra rope on insulators to take strain off balun/coax load.



4:1 balun

Strain relief tie on coax

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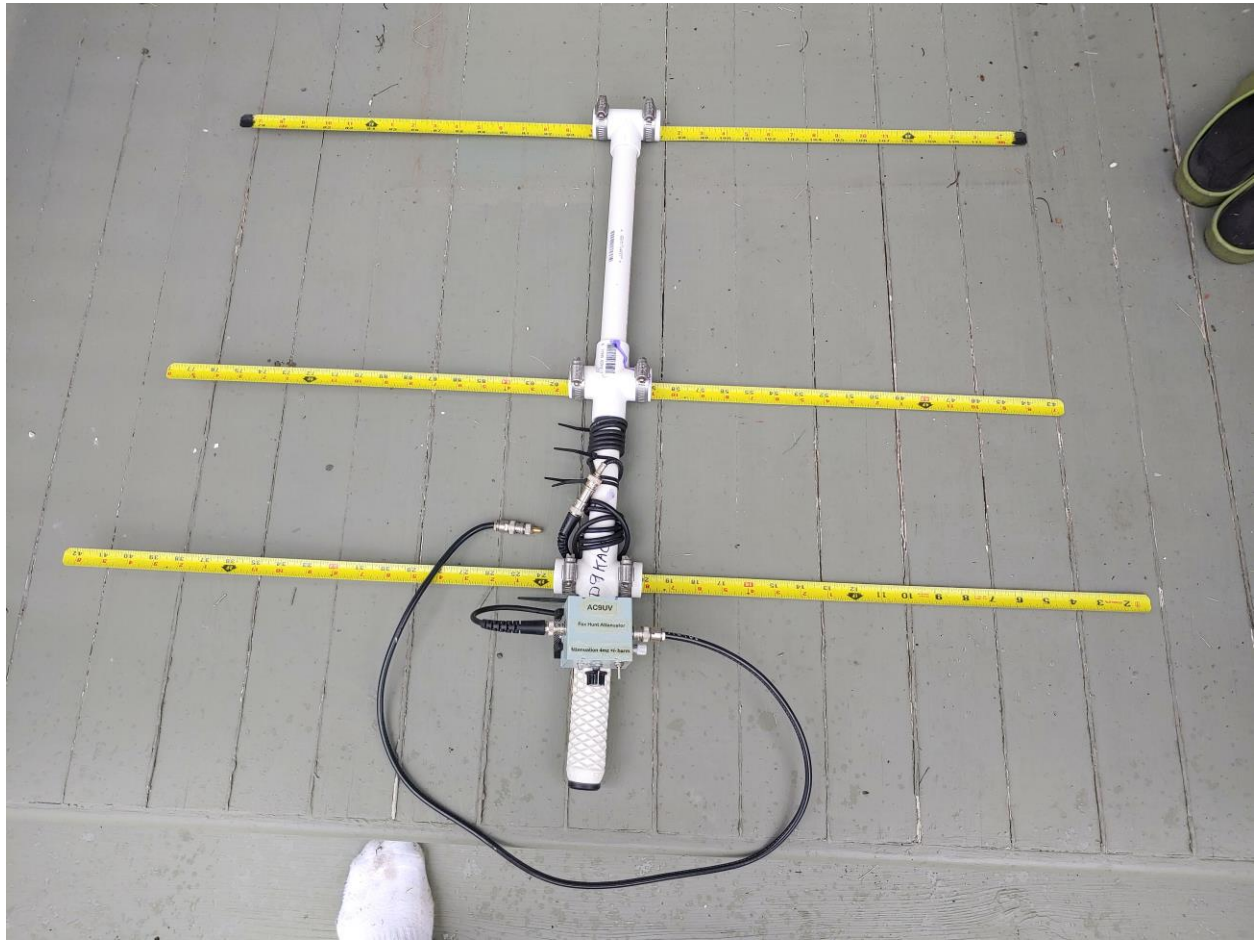
V

2M,7CM TAPE MEASURE YAGI



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3 ELEMENT TAPE MEASURE YAGI

SHEET 2 OF 3

Parts List

- Approx 3ft 1/2" Sched 40 PVC Pipe
- 2 PVC NON-Threaded Caps (1/2")
- 3 PVC Cross Tee
- 1" Wide Tape Measure (At least 10' Long)
- Variable Length of RG-58 Coax Cable
- 6 Stainless Steel Hose Clamps (Adjustable from 7/8 - 1-1/4" or Near)
- 5" of #14 or #12 AWG Soild (Non Stranded) Wire
- Solder
- Sand Paper (Between 60-120 Grit)
- (Optional) Dremel/Rotary Tool with Sanding/Grinding Bit
- Electrical Tape
- PVC Primer / PVC Glue (Optional)

Tools List

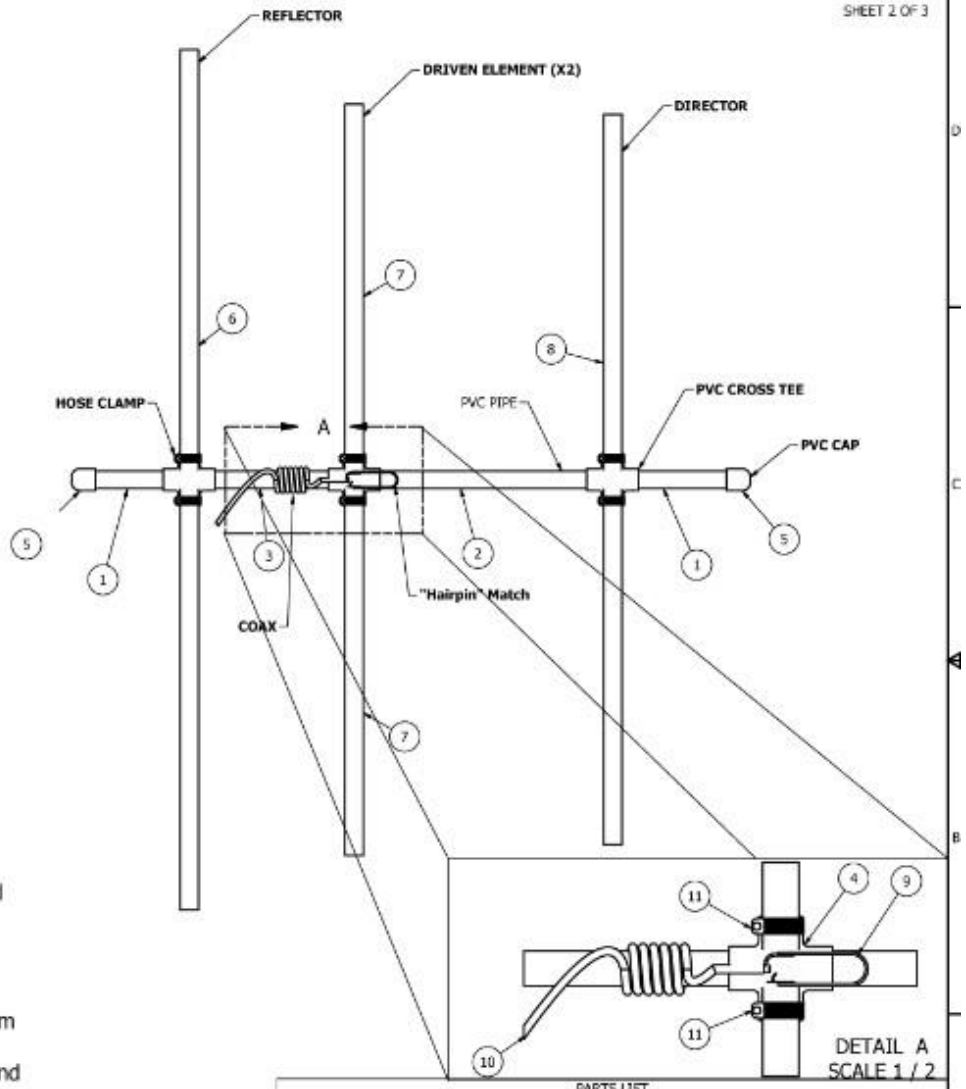
- PVC Cutter / Saw
- Marking device (Sharpie)
- Tin Snips (Aviation Snips) or Shear
- Soldering Iron
- Screwdriver (Flat Head)

Cutting / Assembly Instructions

(Refer to Page 2 and 3)

1. Mark and Cut PVC Pipe to proper lengths
2. Deburr cut PVC pieces with sand paper
3. Using a flat hard surface, assemble PVC pipe, with caps and Cross Tees as shown on this print
4. (Optional) Un-assemble, prime and glue PVC back together.
5. Mark and cut tape measure using tin snips to the proper lengths as shown on blue print
6. On the 17.75" tapes, use sandpaper/dremel to remove plastic and painted coating about 3/8" in diameter to expose the bare metal.
7. Bend wire into "U" shape having approx .75" Gap
8. Assemble Yagi using the tape measure and clamps.
9. On the Driven Element, Solder Hairpin wire match
10. Strip Coax to expose about 3/16" of the center conductor, Make wire from braided shield
11. Solder the center conductor to the bare spot of one of the 17.75" tape and solder the shield to the other 17.75 tape.
12. Wind Coax 6 turns around the 1/2" PVC Pipe and secure with electrical tape

ALL DONE! Adjust SWR by adjusting the spacing between to the two 17.75 Tapes



PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5in-PVC-Pipe	1/2" Sched 40 PVC Pipe - 5in
2	1	11p5in-PVC-Pipe	1/2" Sched 40 PVC Pipe - 11in
3	1	7in-PVC-Pipe	1/2" Sched 40 PVC Pipe - 7in
4	3	4Way-PVC-Tee	PVC CROSS FITTING (1/2" PIPE)
5	2	Cap-PVC-End	1/2" PVC End Cap (Non Threaded)
6	1	41p3755-TapeMeasure	41.375 (41-3/8)" Tape Measure
7	2	17p75-TapeMeasure	17.75 (17-3/4)" Tape Measure
8	1	35p125-TapeMeasure	35.125 (35-1/8)" Tape Measure
9	1	Hairpin	5" of #12 or #14 AWG Solid Copper Wire
10	1	CoiledRG	X" RG-58A 50Ohm Coaxial Cable
11	6	Clamp	7/8" - 1-1/4" Stainless Hose Clamp

Credit To:
Joe Leggio (WB2HOL)
Andy Woolard (AA4XS)
Tom Niderost (K4TMN)

Prints By: Jeffrey Ball - NT1K Http://www.NT1K.com

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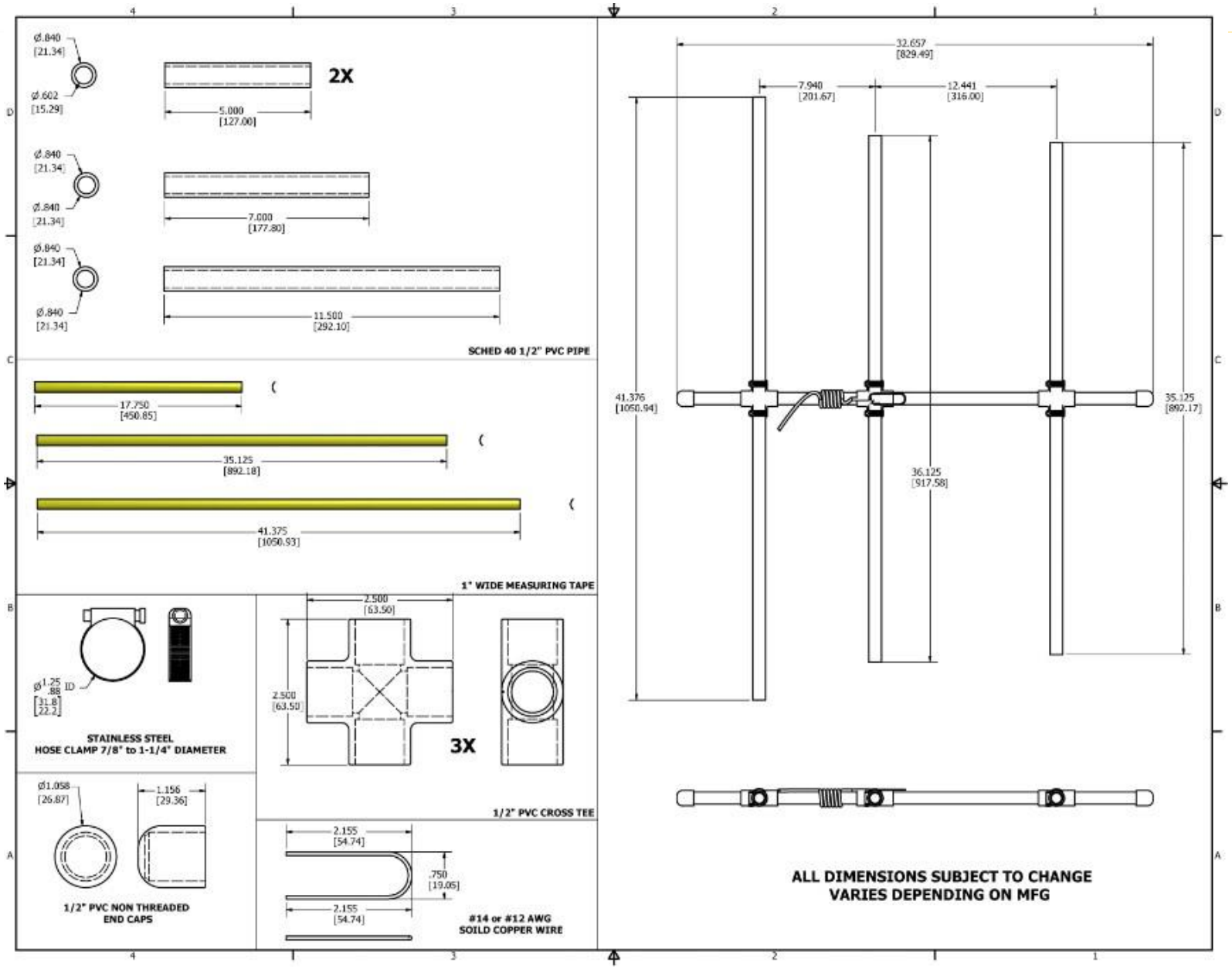
Ø.840
[21.34]
Ø.602
[15.29]
2X
5.000
[127.00]
7.000
[177.80]
11.500
[292.10]
SCHED 40 1/2" PVC PIPE
17.750
[450.85]
35.125
[892.18]
41.375
[1050.93]
1" WIDE MEASURING TAPE
Ø1.25 .88 ID
[31.8 22.2]
STAINLESS STEEL
HOSE CLAMP 7/8" to 1-1/4" DIAMETER
2.500
[63.50]
3X
1/2" PVC CROSS TEE
Ø1.058
[26.87]
1.156
[29.36]
1/2" PVC NON THREADED
END CAPS
2.155
[54.74]
.750
[19.05]
#14 or #12 AWG
SOILD COPPER WIRE
32.657
[829.49]
7.940
[201.67]
12.441
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41.376
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[892.17]
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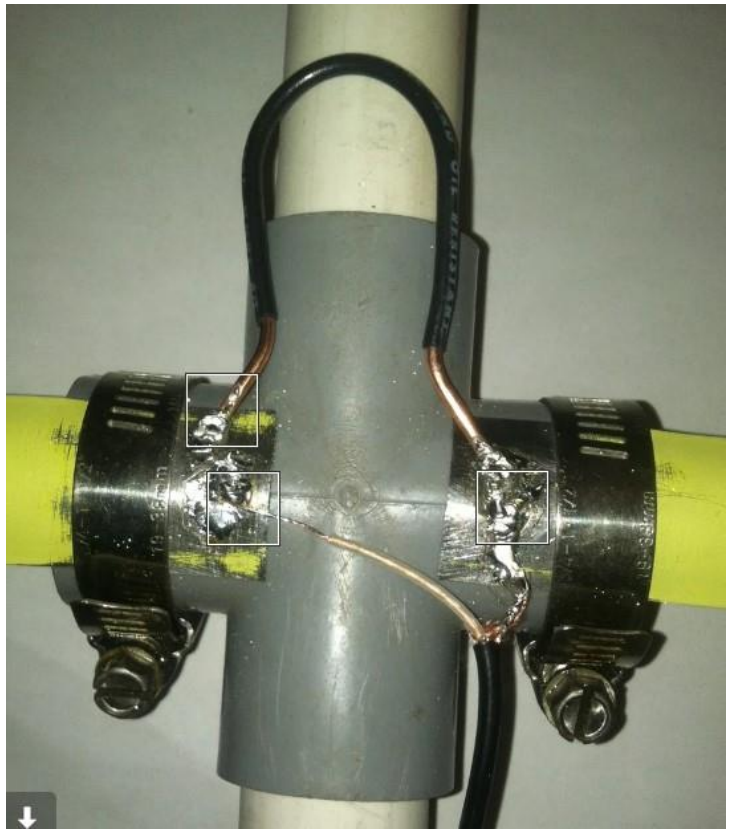
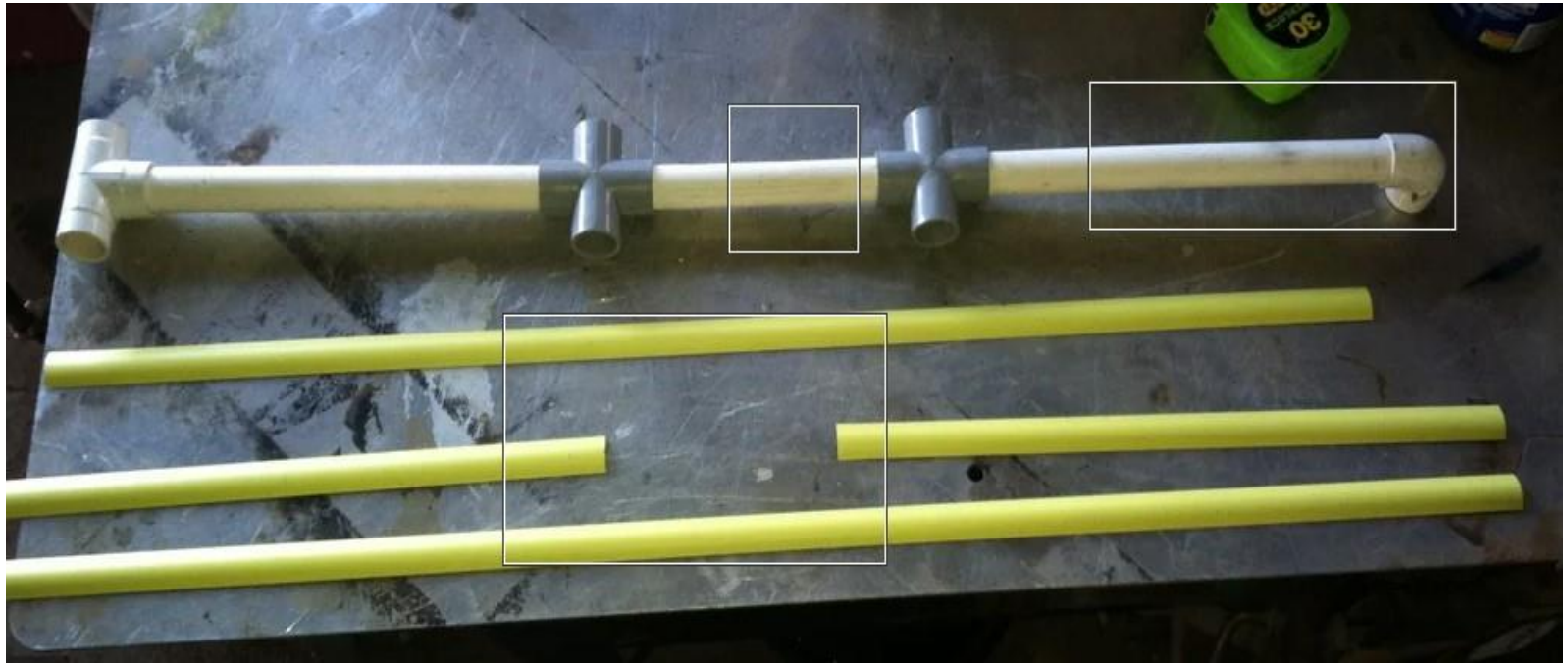
ALL DIMENSIONS SUBJECT TO CHANGE
VARIES DEPENDING ON MFG

AC9UV





https://www.instructables.com/The-Tape-Measure-Antenna/

AC9UV

Step 4: Adjusting the Antenna

Adjusting the antenna is very simple. Simply attach a SWR meter between the antenna and the radio. Adjust your radio to 146.580 mhz and check your SWR reading.

If the reading is more than 1.2 to 1, turn off your radio and adjust the driven elements by loosening the hose clams and moving the elements toward each other.

Turn on your radio and check your SWR again. Repeat until your SWR is at an acceptable level. I was lucky and my antenna registered extremely close to 1 to 1 without adjustment.

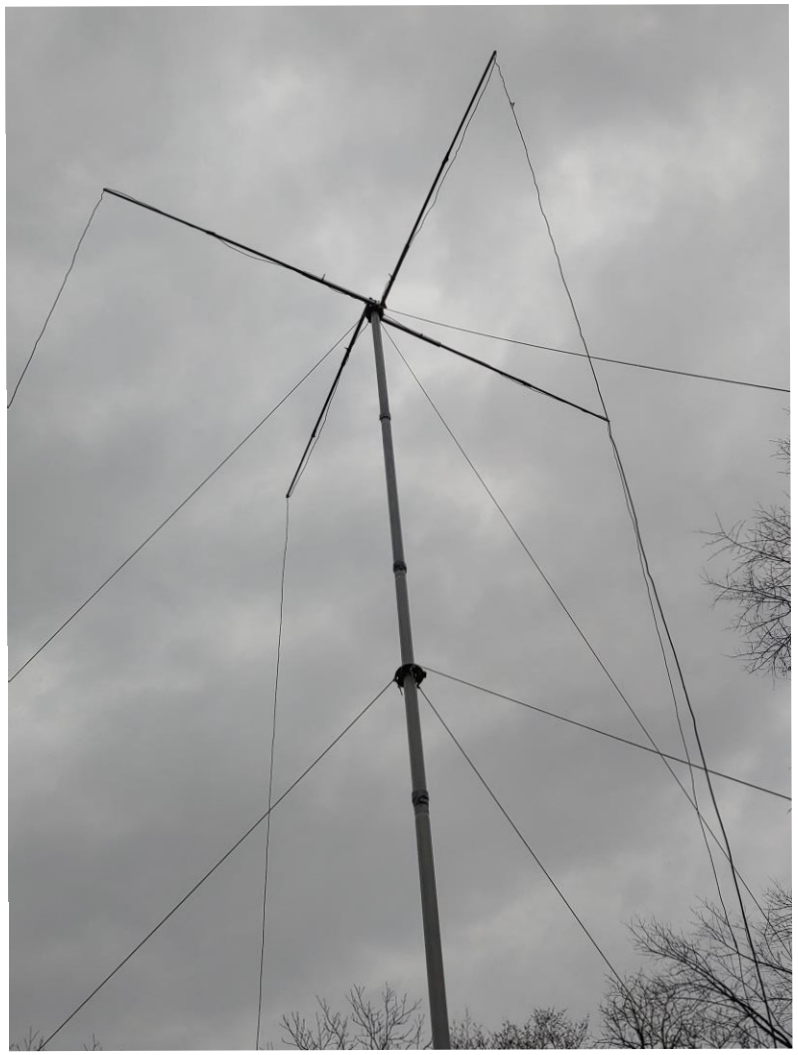
https://www.instructables.com/The-Tape-Measure-Antenna/

My original source, Yanko NX9G presentation at York Radio Club meeting March 2019

- http://yorkradioclub.org/wp-content/uploads/2019/03/NX9G-Yanko-Yankov-2-meter-direction-finer-antenna.pdf
- http://yorkradioclub.org/wp-content/uploads/2019/03/NX9G-Yanko-Yankov-Getting-started-with-Amateur-Radio-Satellites-.pdf

What for? Originally to do Satellite work

Also good for Fox hunting!!



Double Delta

DOUBLE DELTA

- A tall narrow delta loop, due to its unique current distribution, is largely horizontally polarized.

- Azimuth Gain Figure 15-2: EZNEC azimuth radiation patterns: 80m (green), 40m (red), 20m (blue), 10m (violet). Gains in dBi.
-

Portune W6NBC, John. Slot Antennas for Ham Radio: The Forgotten Antenna (pp. 128-129). Kindle Edition.

Azimuth Gain

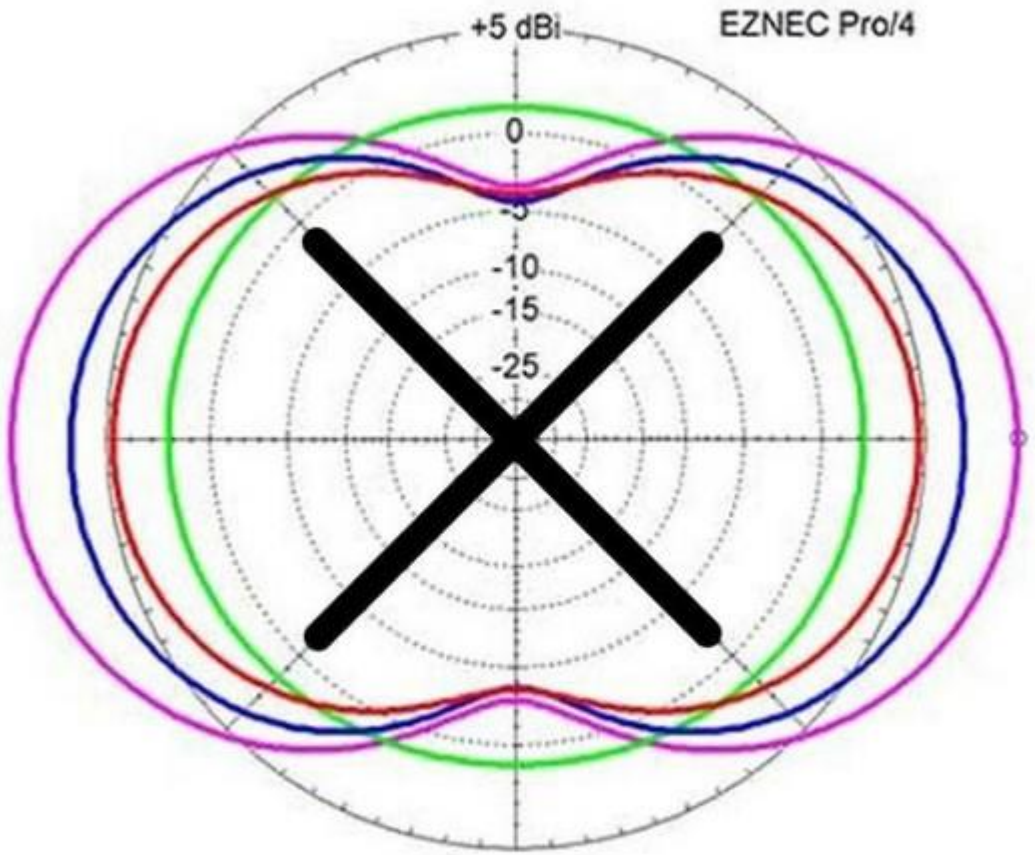


Figure 15-2: EZNEC azimuth radiation patterns: 80m (green), 40m (red), 20m (blue), 10m (violet). Gains in dBi.

A further benefit of the inverted double delta loop slot over a conventional vertical is that it radiates from higher up the antenna.

Its effective height is more like that of a beam on a tower. This reduces ground loss and improves gain.

Portune W6NBC, John. Slot Antennas for Ham Radio: The Forgotten Antenna (p. 131). Kindle Edition.

To see why the take-off height of the wave is higher, notice, Figure 15-5, that the currents at the bottom of a tall narrow slot loop are nearly equal and opposite. Therefore, there is little radiation from the bottom.

At the top, however, the current in the horizontal direction only and is unopposed. That part of the loop radiates. Further the radiation is largely horizontally polarized.

Single Delta
Current profile.

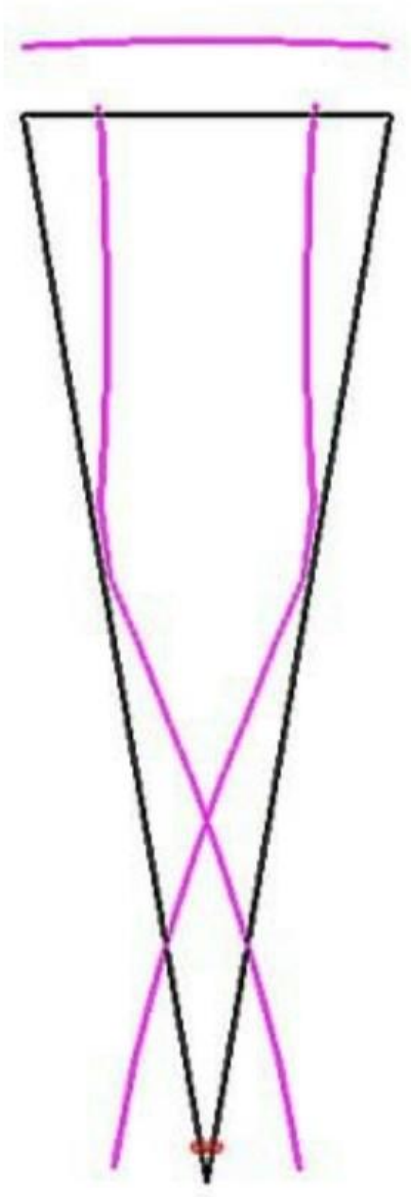


Figure 15-5

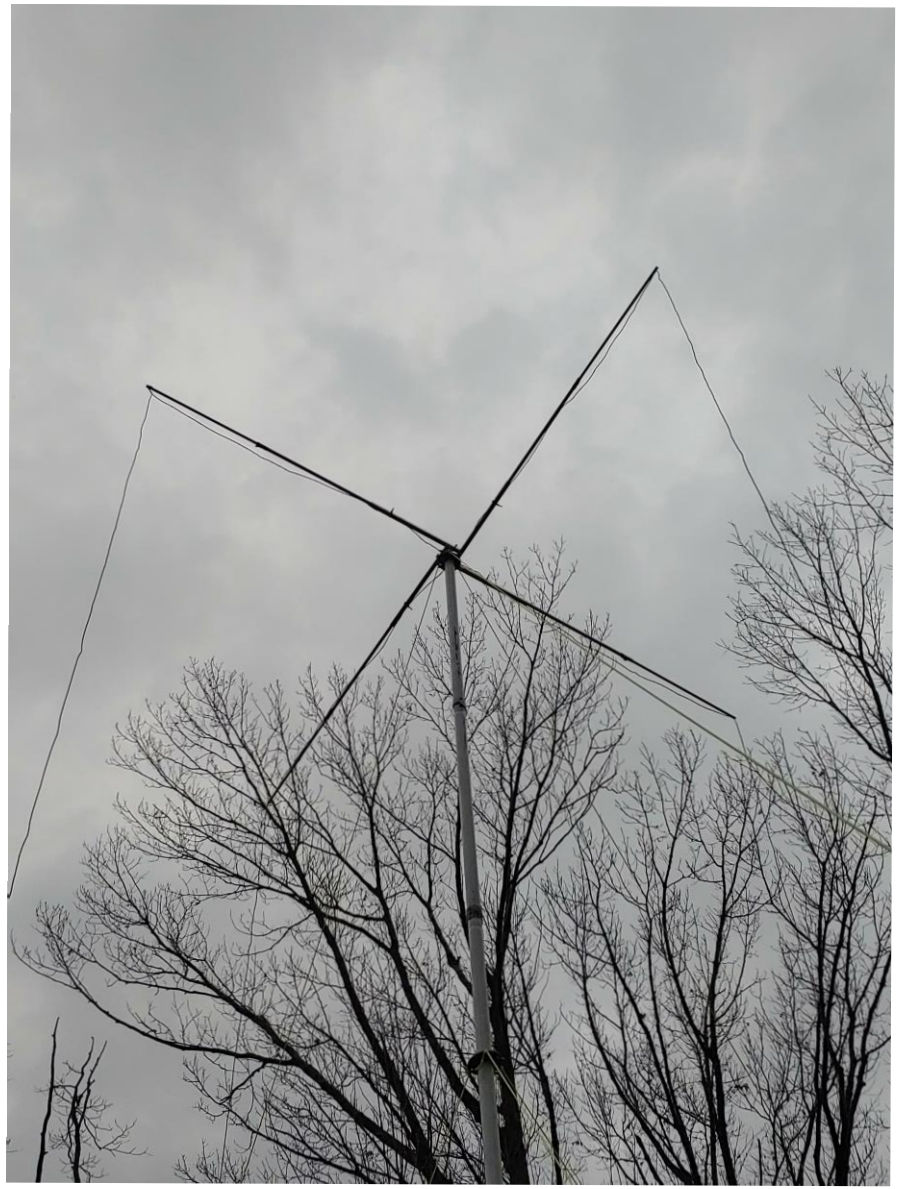
AC9UV

Double Delta

For optimum efficiency and gain, the width of a skeleton slot delta should be kept to roughly 1/3 of the height. Four 4 ft. cross-arm spreaders are suitable for a 30 ft. delta, 5 1/2 ft. for a 40 ft. delta.

My Double Delta is about 28ft high with 4 ½ foot cross arms, or 9ft across the top (two cross arms). I use an aluminum mast. The ends are about 1ft from the ground.

Portune W6NBC, John. Slot Antennas for Ham Radio: The Forgotten Antenna (p. 142). Kindle Edition.



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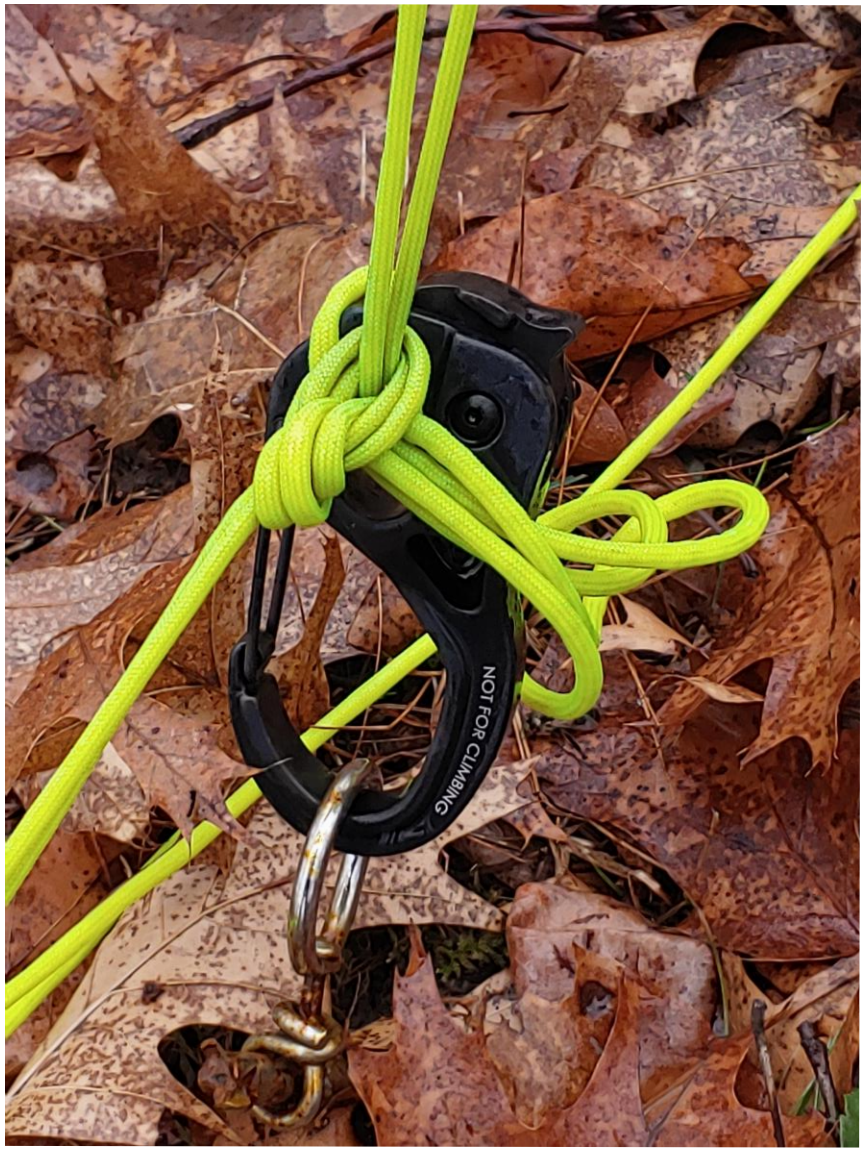
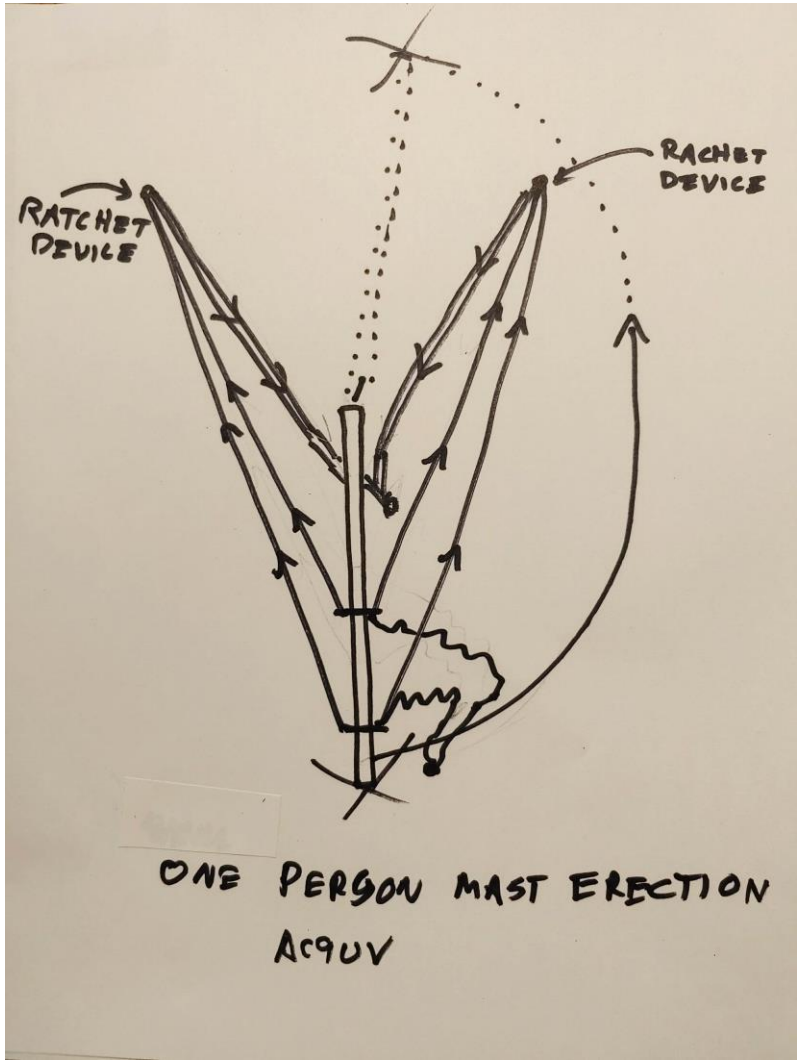
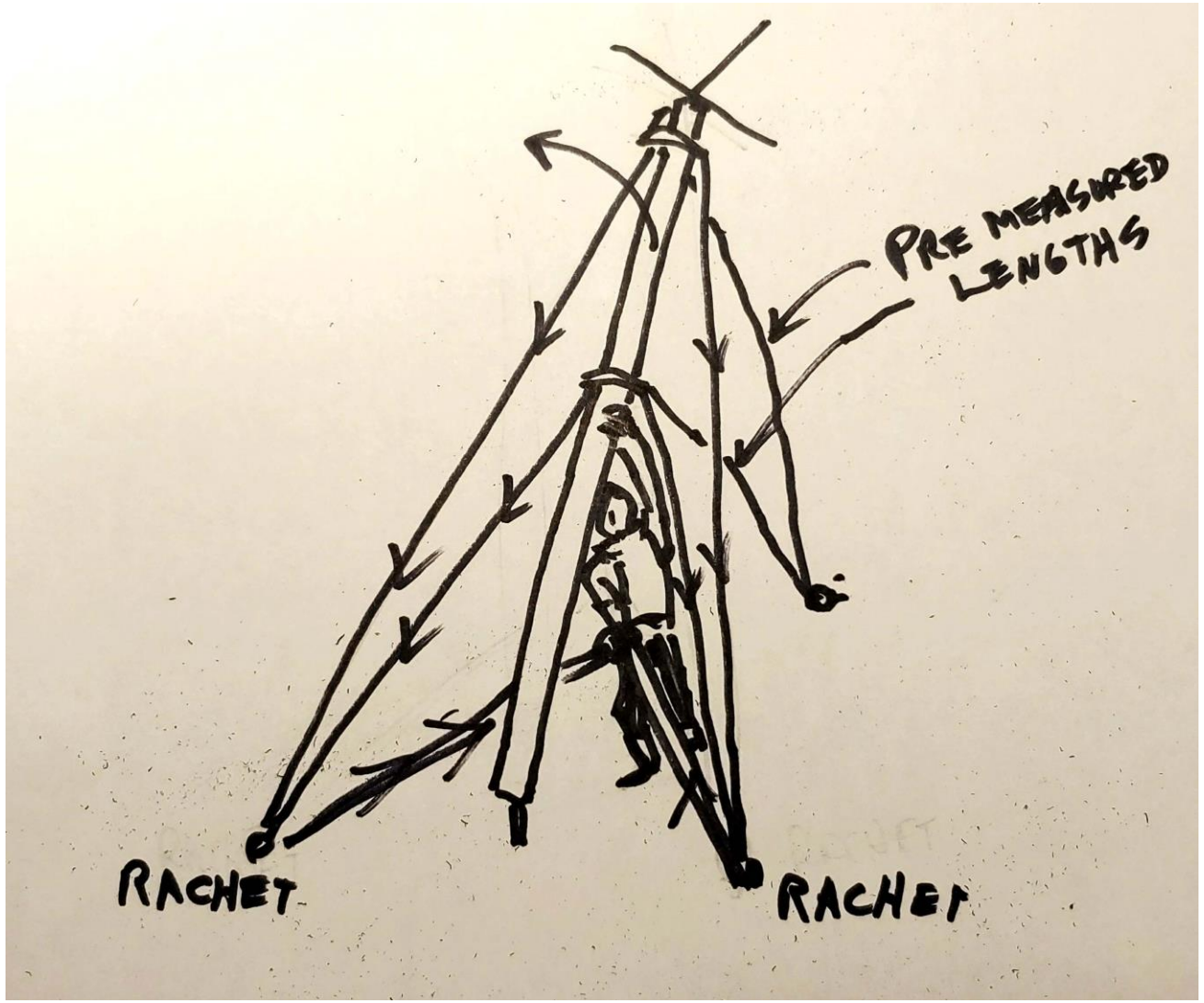
AC9UV


NOT FOR CLIMBING



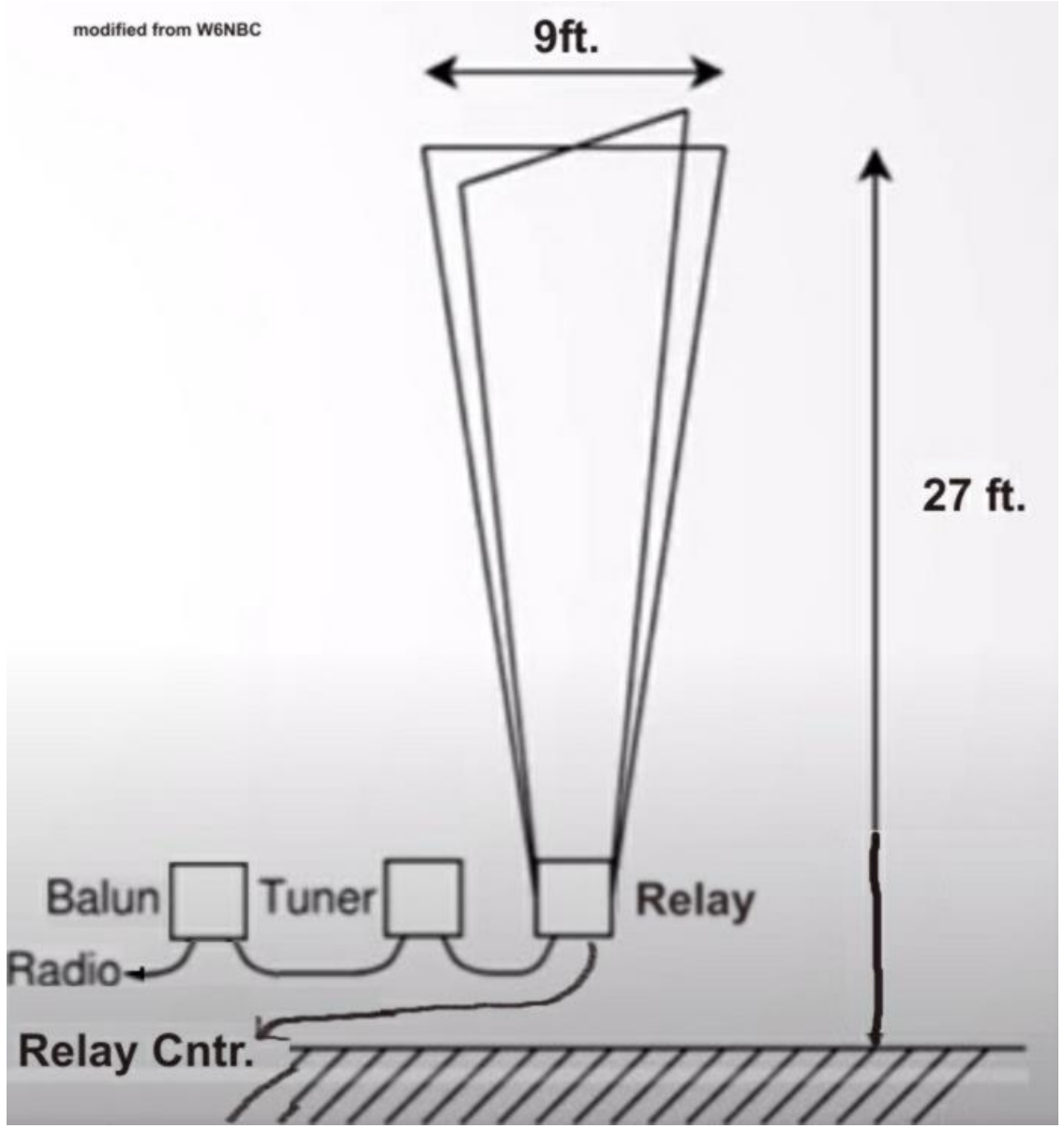


Top View

Raising a light mast by yourself

Side View

AC9UV



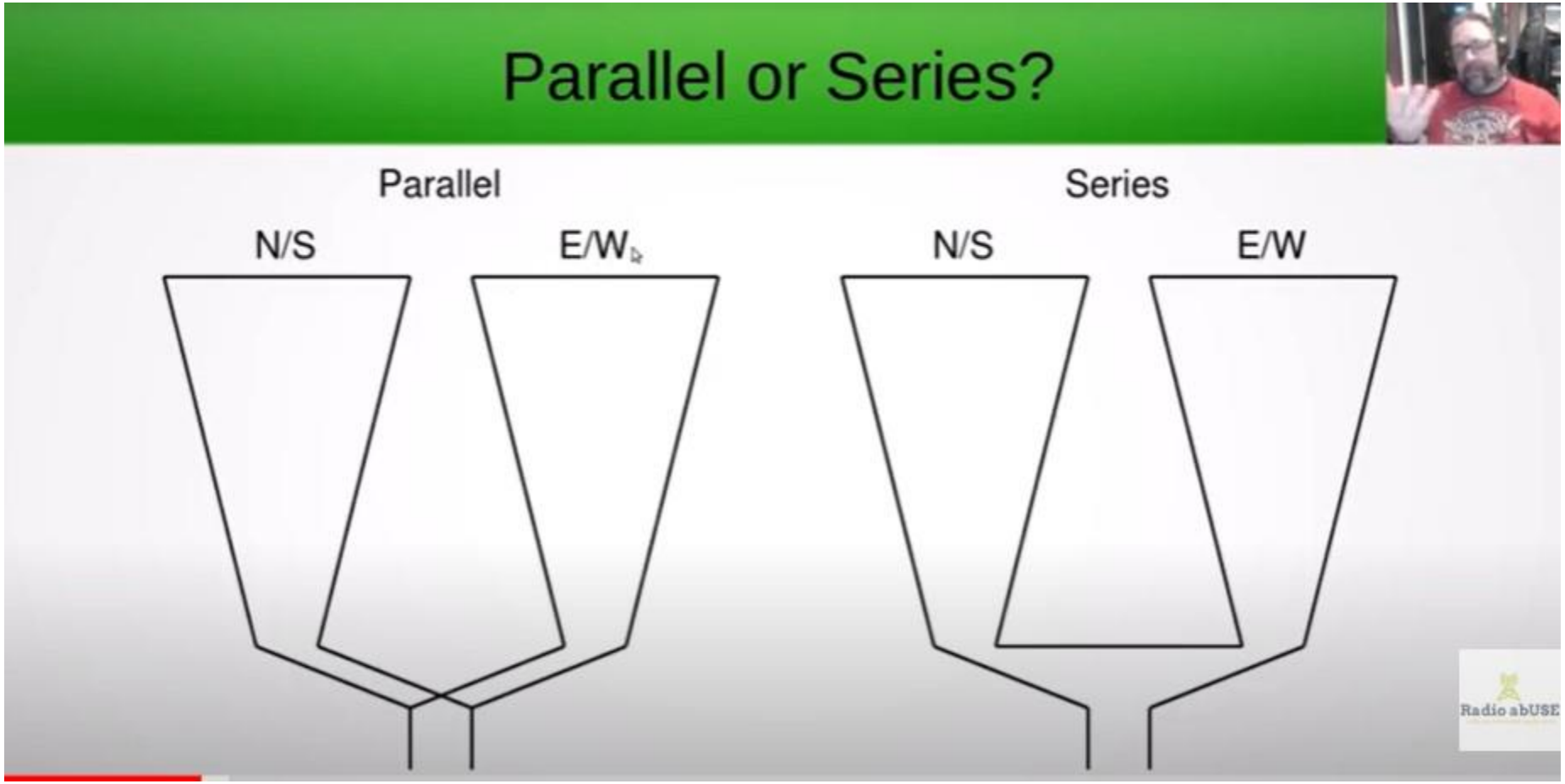
Double Delta Radio Interface.

-Relay to change beam direction

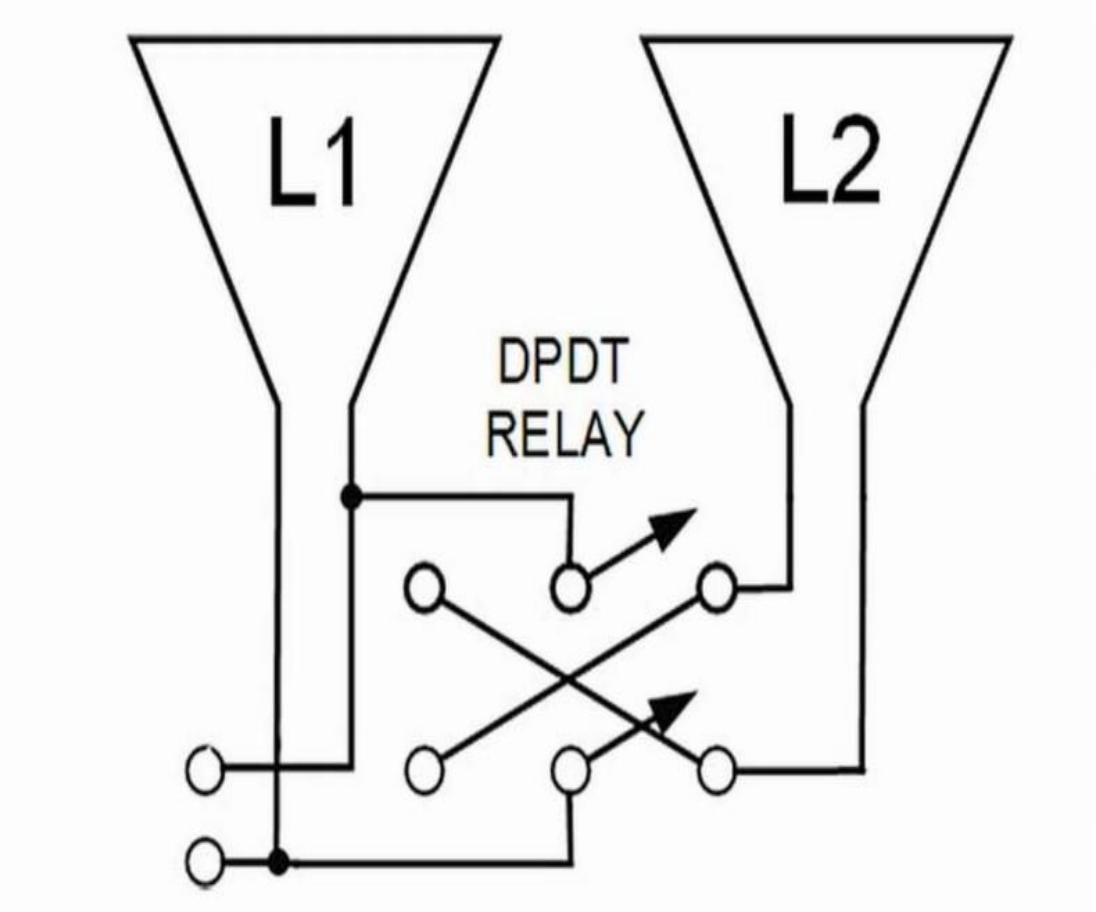
-ATU to match 50ohms

-1:1 Balun to cut down line loss

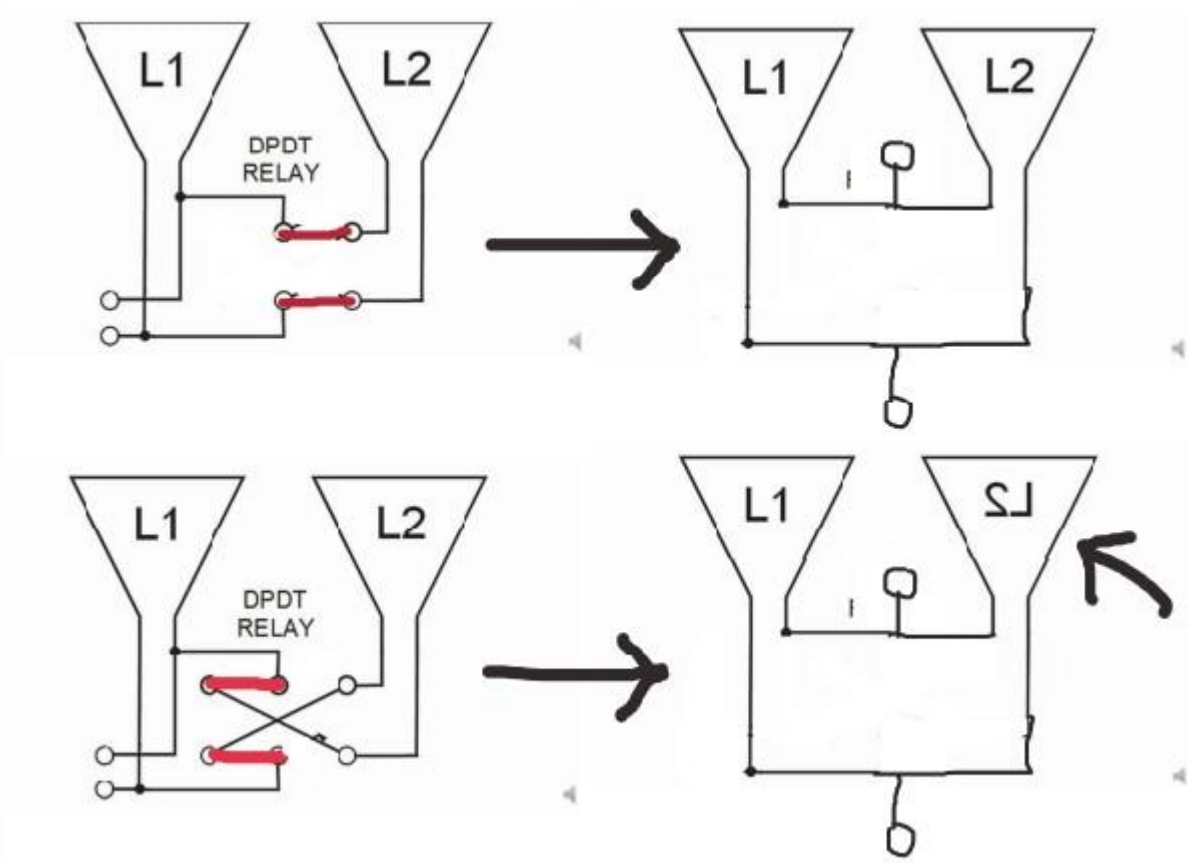
AC9UV



AC9UV

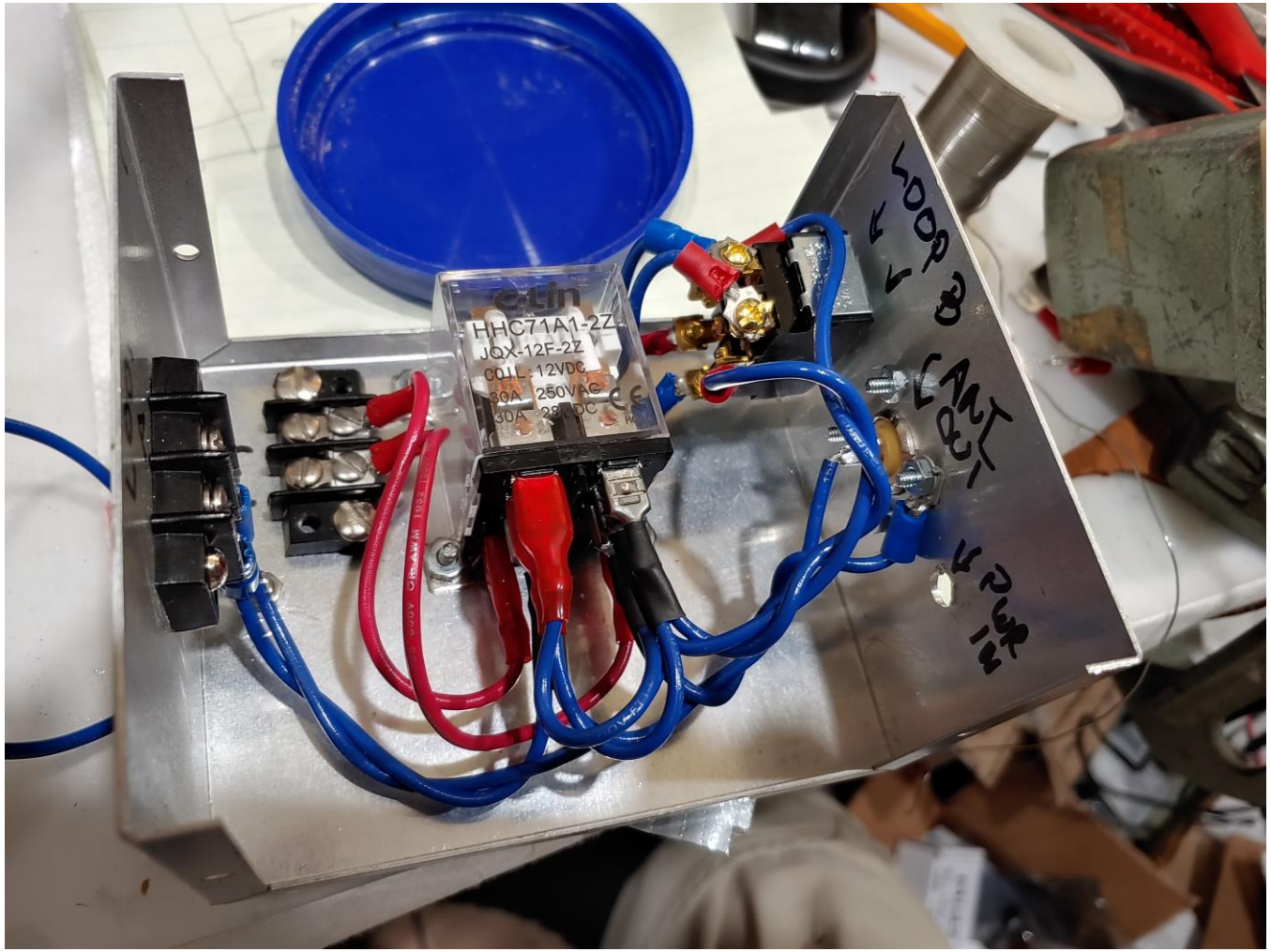


Relay to switch Antenna



What the switching does

AC9UV



Relay box

AC9UV

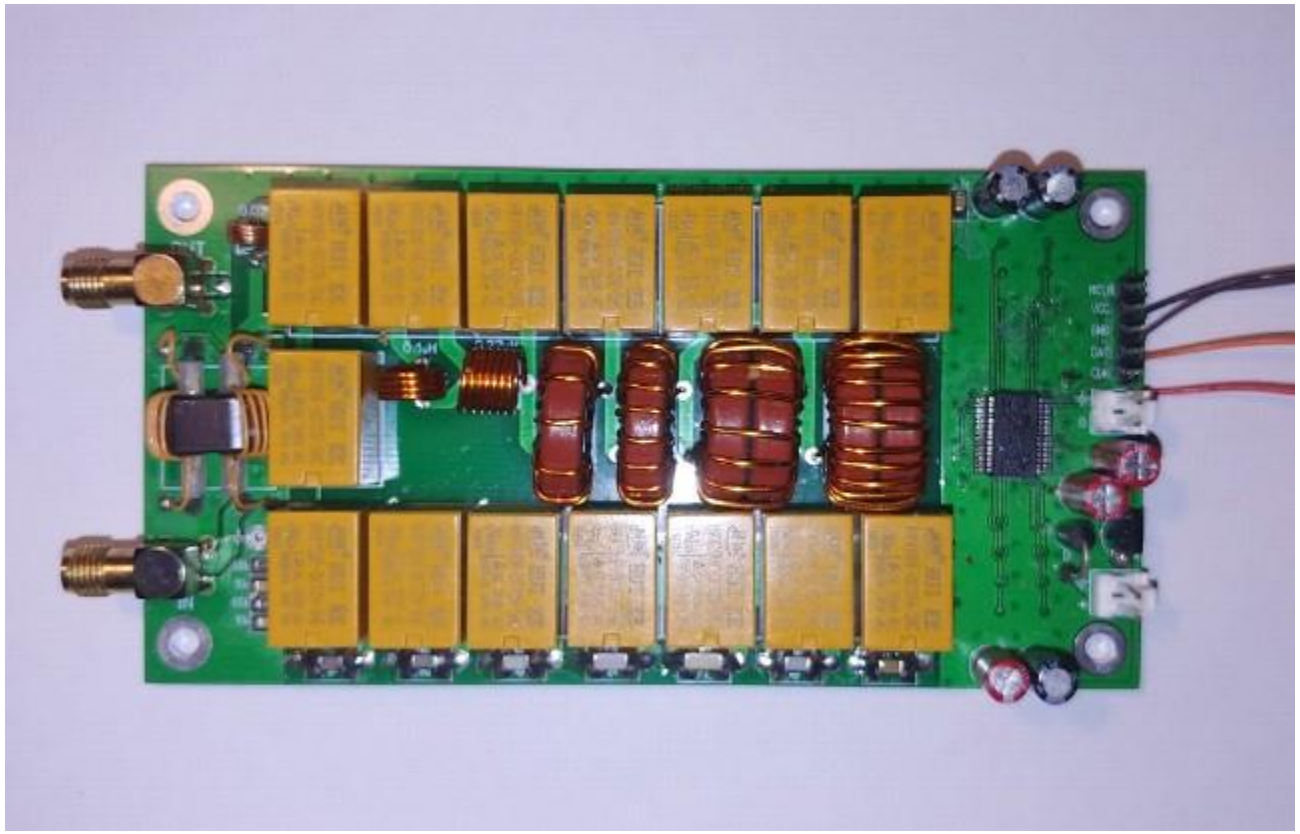
Antenna Tuning Unit

I discovered this ATU recently and it looked interesting.

ATU (Automatic Antenna Tuner) developed by N7DDC.

- Power supply range: 10 - 15 VDC
- Max current : 450mA
- Max working power: 100 watts
- Max measured power: 150 watts
- Minimum power for tuning start: 1 watt
- Recommended maximum power while tuning not above 30 watts. (after tuning you can set 100 watts and work on this power)
- Minimum measured power: 0.1 watt
- Step for measurement on powers under 10 watts: 0.1 watt
- Step for measurement on powers above 10 watts : 1 watt
- Power measurement accuracy : 10%
- Maximum inductance set: 8.5 uH
- Minimal step for setting inductance: 0.1 uH
- Maximum installed capacity: 1870 pF
- Minimal step for setting capacity: 10 pF

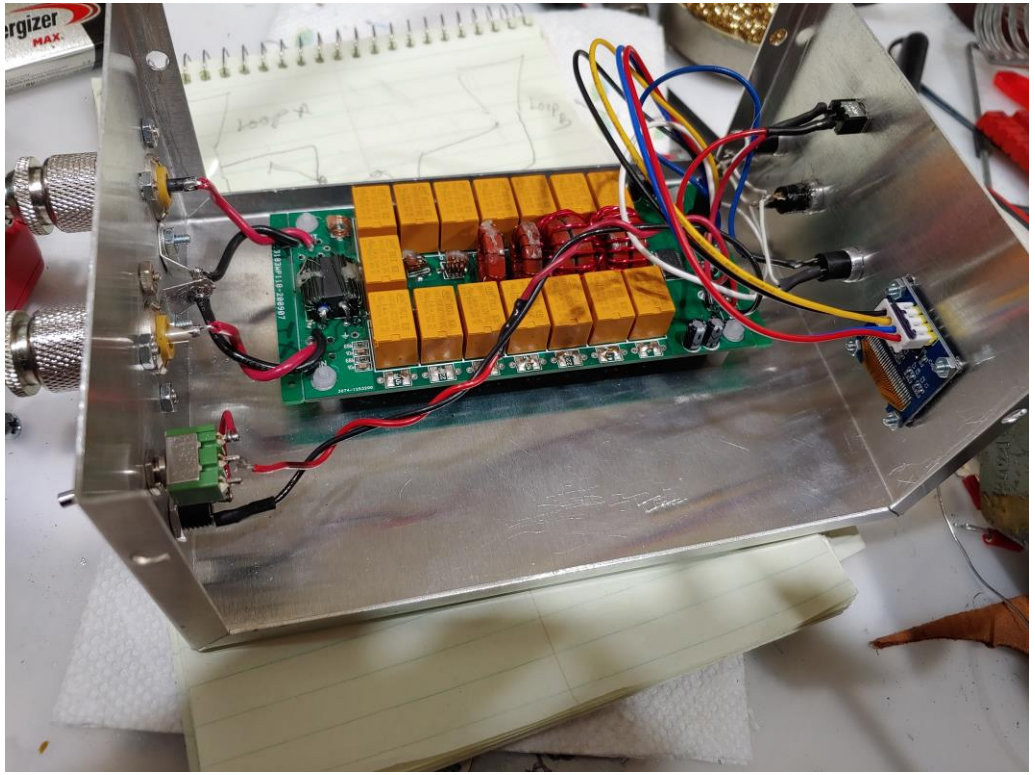
100 Watts tuner, 7x7 (7 capacitors x 7 coils) based on PIC 16F1938.

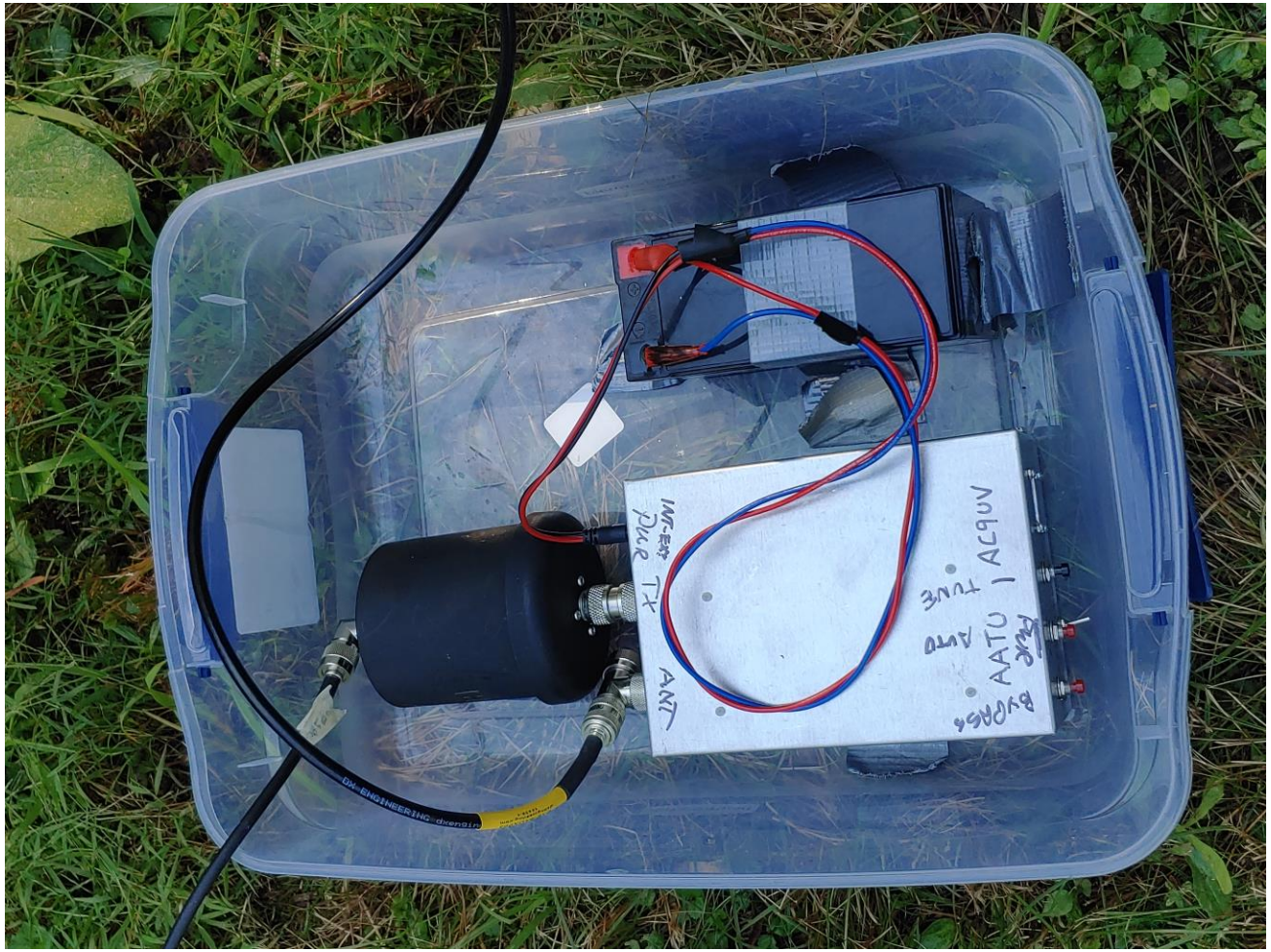


ATU Assembled

ATU Display

AC9UV





ATU and Balun box

Its been up for over a year now in high winds, rain, snow. It seems to have a low wind profile.

The ATU saves settings for frequency but the youtube by N6NBC pointed out that when you switch the antenna configuration you should re-tune which it doesn’t. Something to think through.

The beaming has effect, you can tell by the reception when you click the switch. Overall a worthy project.

AC9UV

End Fed Half Wave Antennas

End fed half wave antennas have become very popular as a very convenient low visual impact antenna that is easy to erect for home and also for portable use. It is straightforward and build, and quite low cost. There are also many options are available to purchase. With a little care, the end fed half wave, EFHW antenna is an ideal choice for many ham radio, and even other forms of radio communication station.

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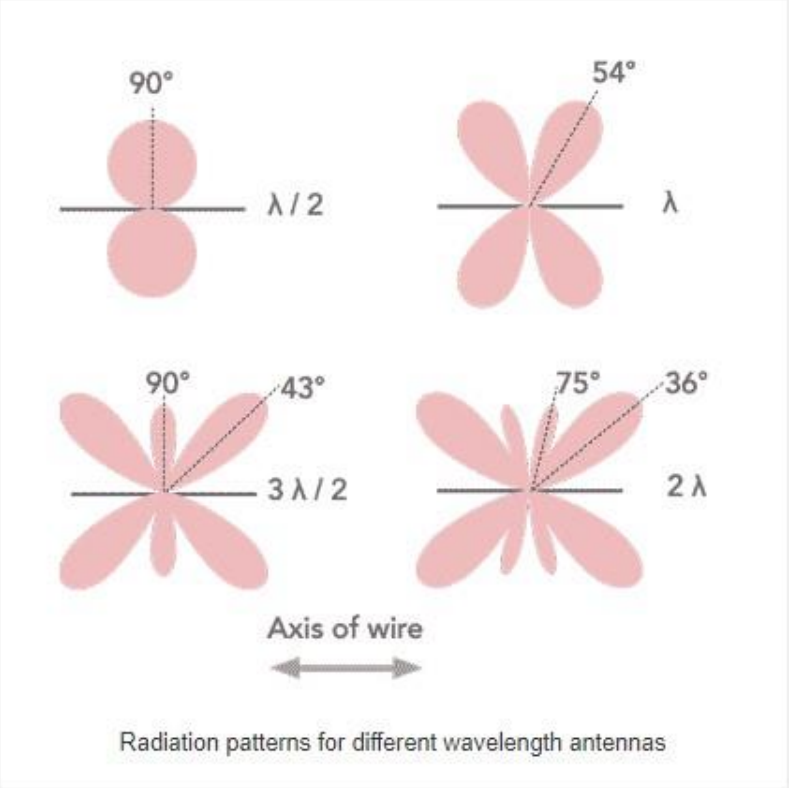
End Fed Half Wave Antennas

As the length increases, the radiation pattern changes with additional lobes forming, and the maximum points of radiation moving away from being at right angles to the axis of the wire and moving towards alignment with the axis of the wire.



Radiation patterns for different wavelength antennas

Attach the antenna to the radio, you get what you get. Keep on Hamming. AC9UV

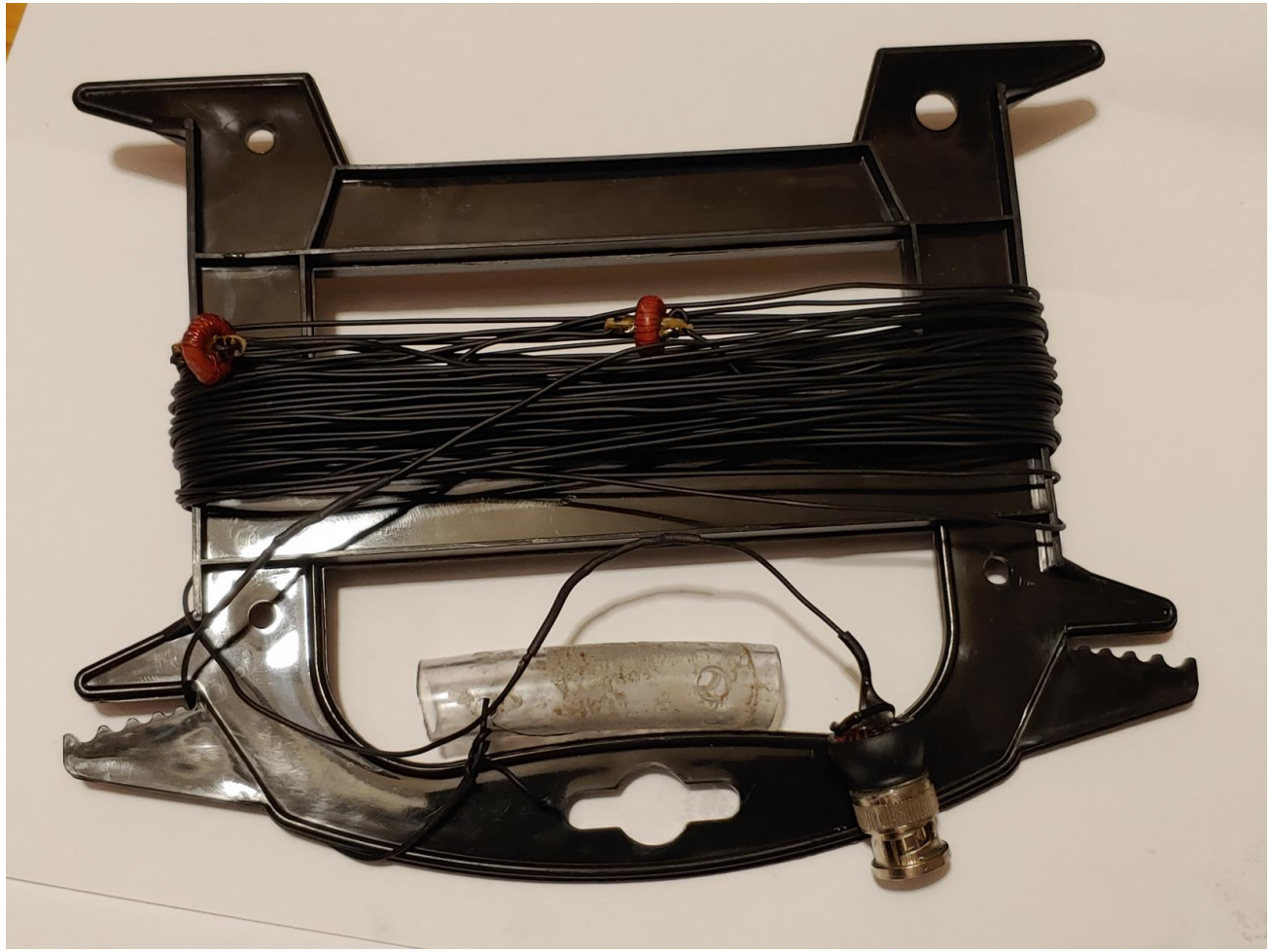
End Fed Half Wave Antennas

In order to match the end fed half wave antenna to the coaxial feeder, it is necessary to have a matching network or transmission line transformer. The coaxial feeder is likely to be 50Ω and the antenna impedance is possibly around 4000 or 5000Ω, the impedance needs to be matched. …

The impedance transformation is approximately 50:5000 or 1:100. As the impedance at this point is not well defined, many people use a 1:9 transformer, although this only matches to an impedance of 450Ω. It is far preferable to use a 1:49 or 1:64 ratio.

Here's where the art and testing kick in after you run the formulas. AC9UV

Stealth Multi Band Trapped End Fed



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Project found on two Youtube videos from K6ARK

First the Transformer build:

https://www.youtube.com/watch?v=s-_LyhdGapM&t=1s

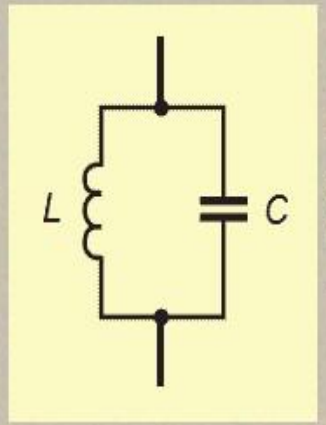
Then the traps and tuning build:

https://www.youtube.com/watch?v=-qfCQTZSIus

AC9UV

Simple Building and Tuning of Traps (by DK7ZB)

Traps are useful for multiband operating of all kinds of antennas. It is much easier to build traps as you think and you do not need any special measuring equipment for tuning. Only a transceiver each ham is owning will be needed and a simple homemade measuring circuit.

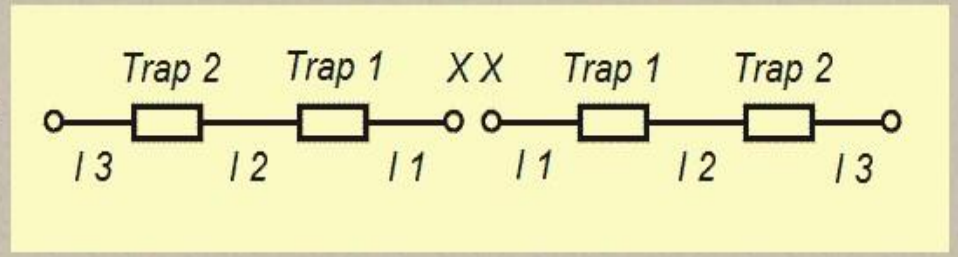


A trap is a parallel circuit of L and C on the frequency you want to close an antenna segment.

For n working frequencies of an antenna, you need n-1 traps in each part of the antenna. For example a 2-band-dipole needs one trap in each half of the antenna.

The trap can consist of a coil and a separate HV-capacitor. Another method for building traps with coax-cable will be described down.

Here we see the principle of a 3-band-dipole. If we need 10 m, 15 m and 20 m, trap 1 will be resonant on 28,5 MHz and trap 2 on 21,2 MHz.



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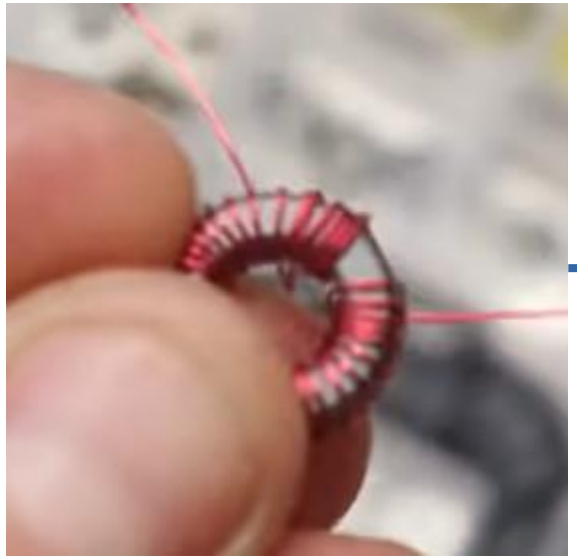
Transformer Build



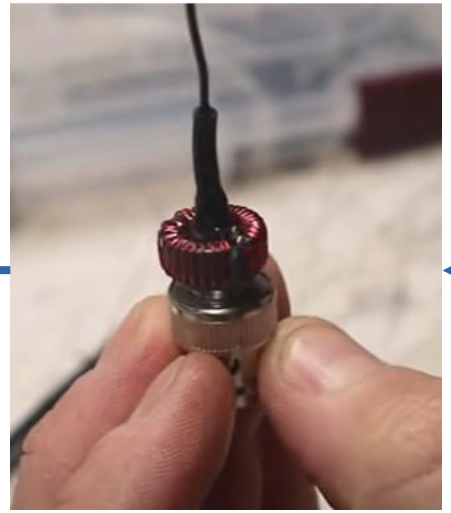
Wrap Transformer 10:1 ratio

Solder SMD Cap

Solder Toroid

Tune unit by adjusting # turns

Seal and Shink wrap



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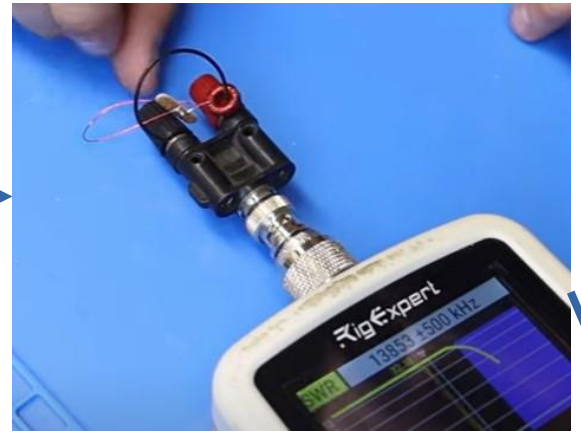
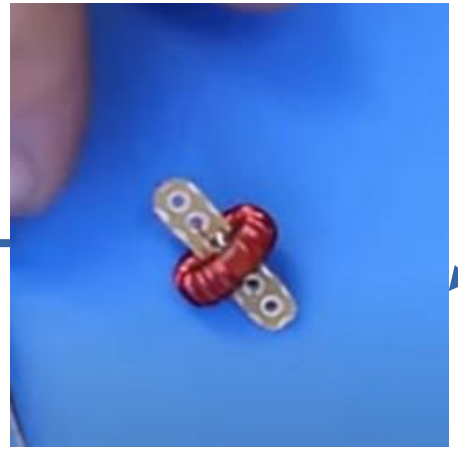
Trap build (x2)

Wind Toroid

Cut Bread Board and solder SMD Cap



Breadboard and tune # turns



Assemble trap

Feed wire, strain relief

Ready for next step

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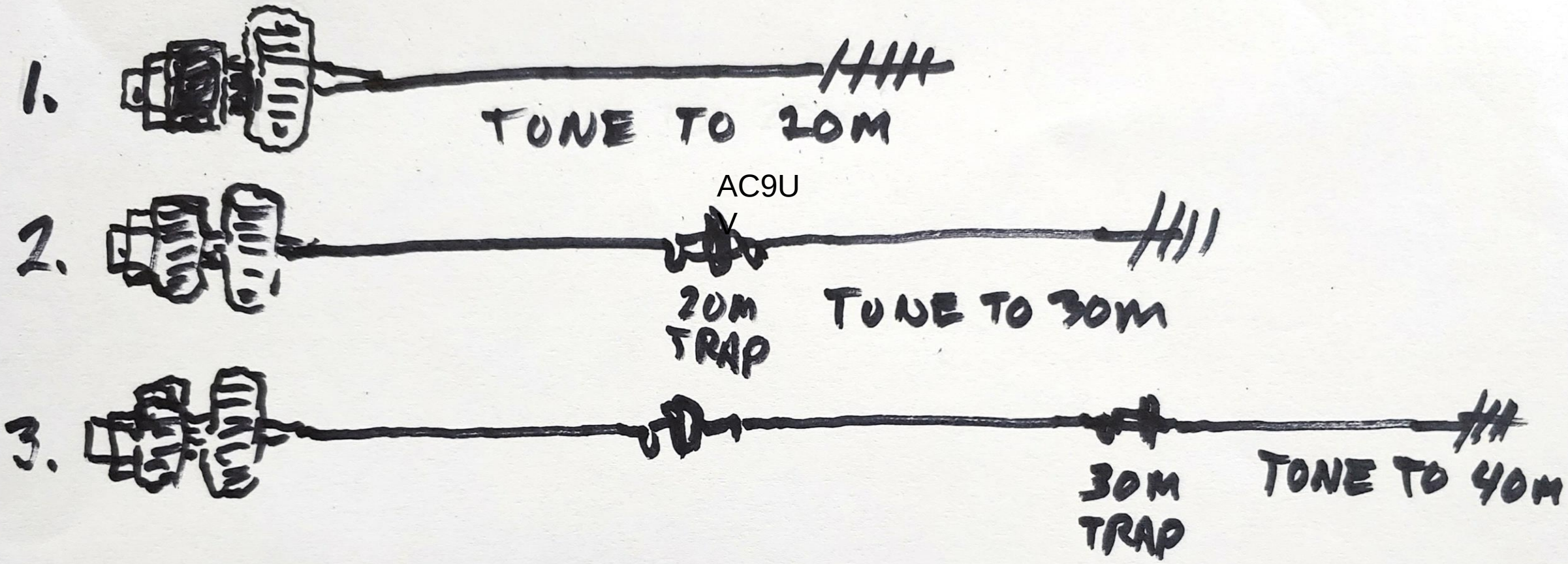
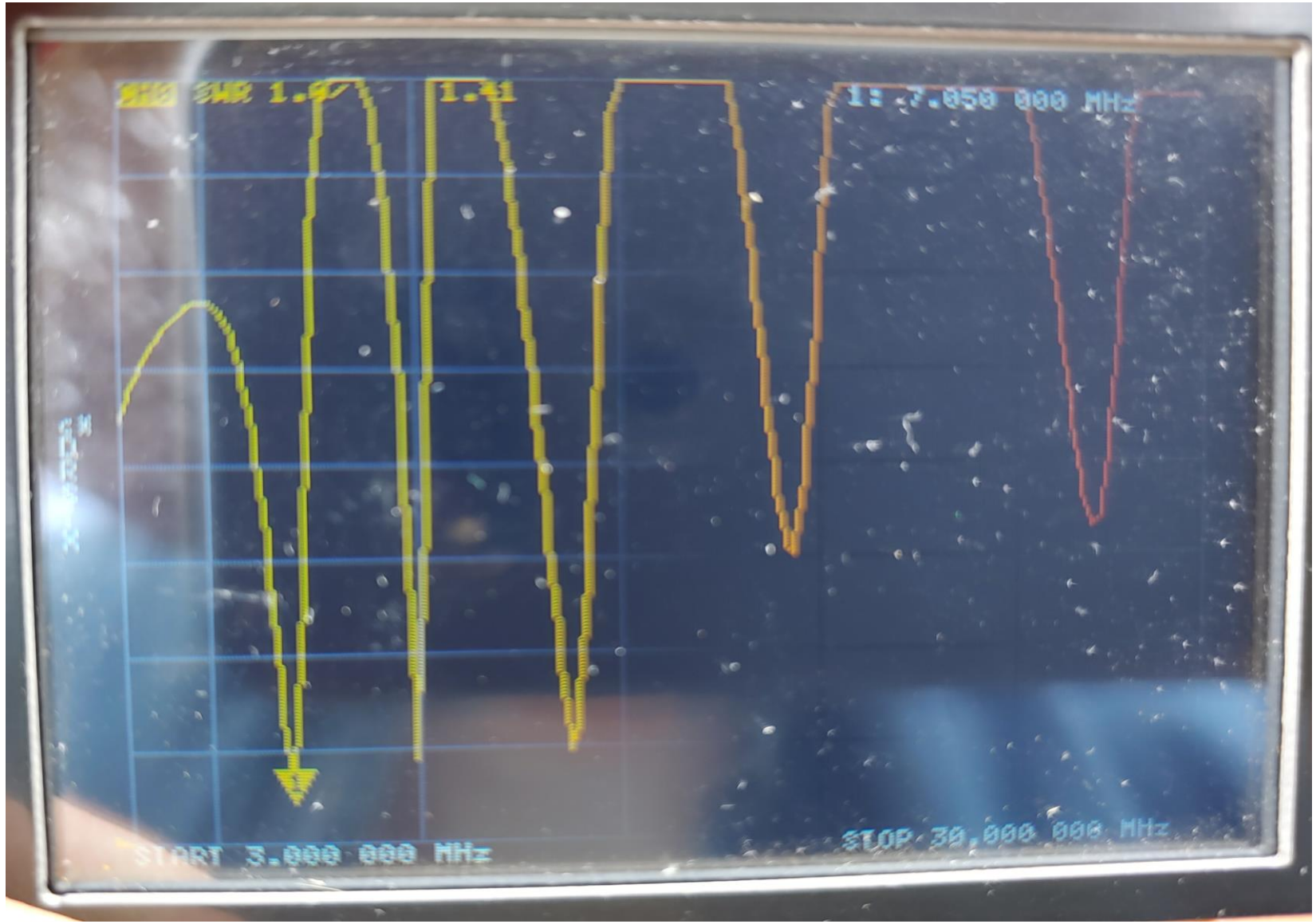
AC9UV

BUILD AND TONE MULTI BAND TRAPPED ANTENNA

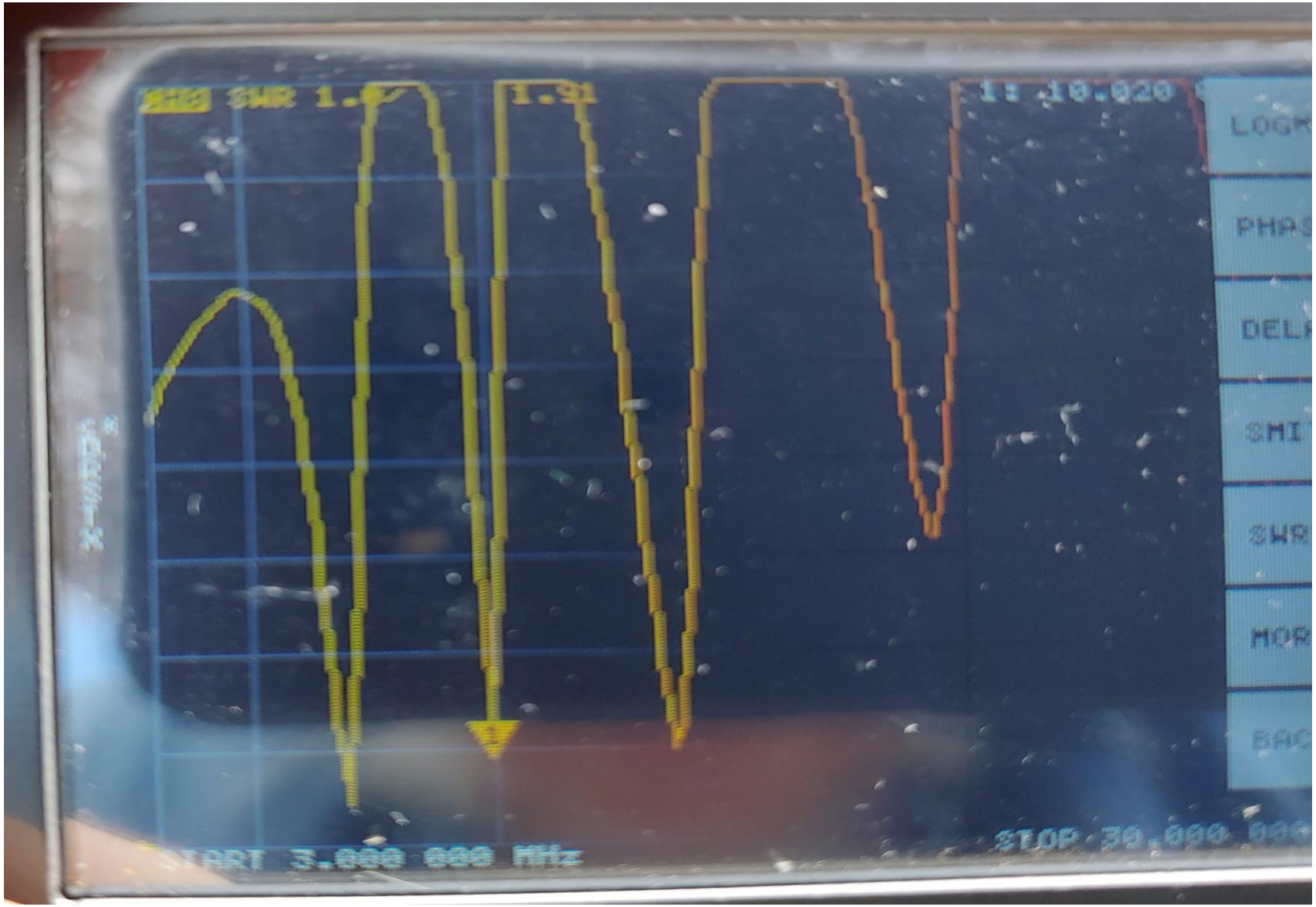


AC9UV



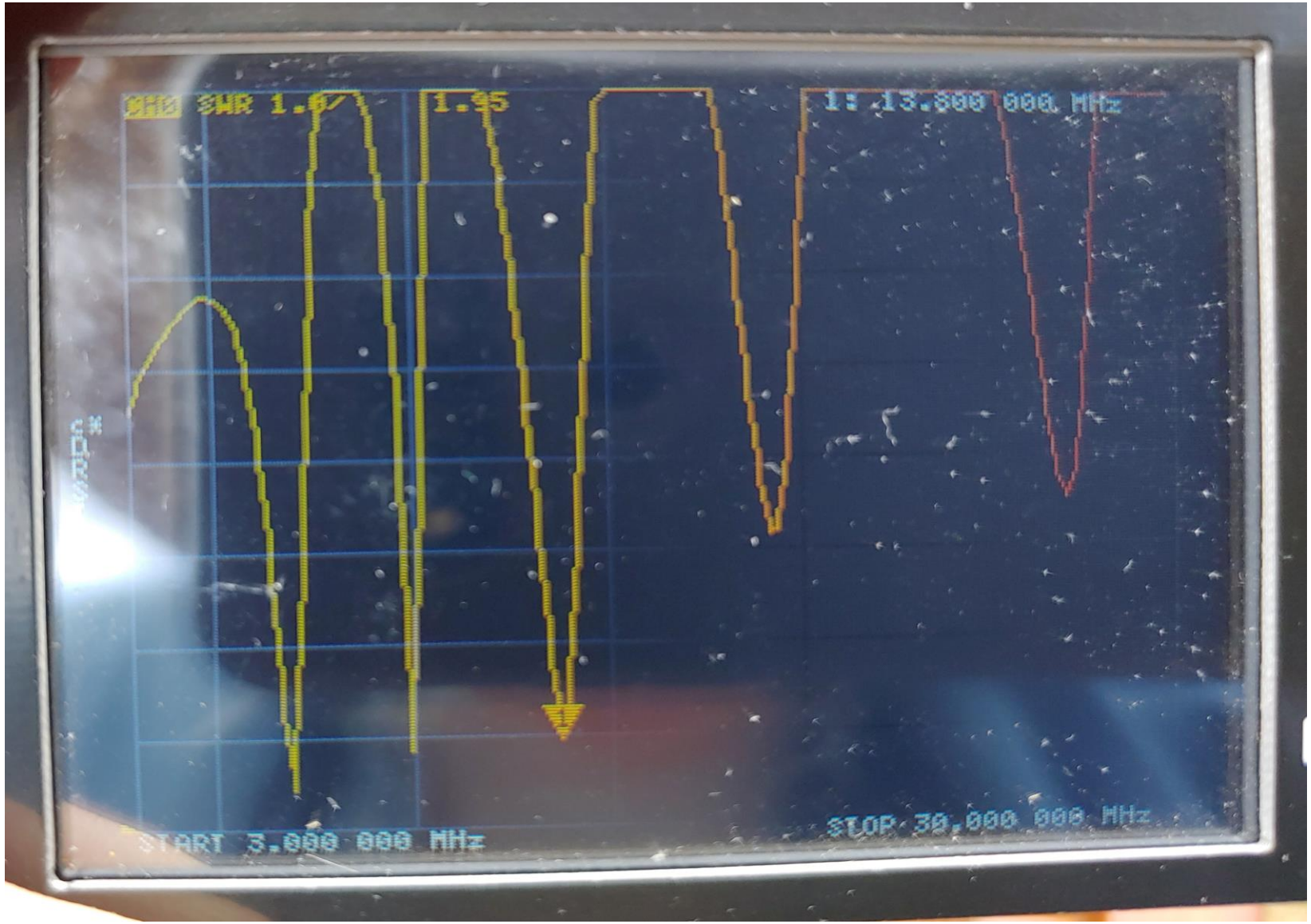
Stealth 3 band: 40m dip

AC9UV



Stealth 3 band: 30m dip

AC9UV



Stealth 3 band: 20m dip

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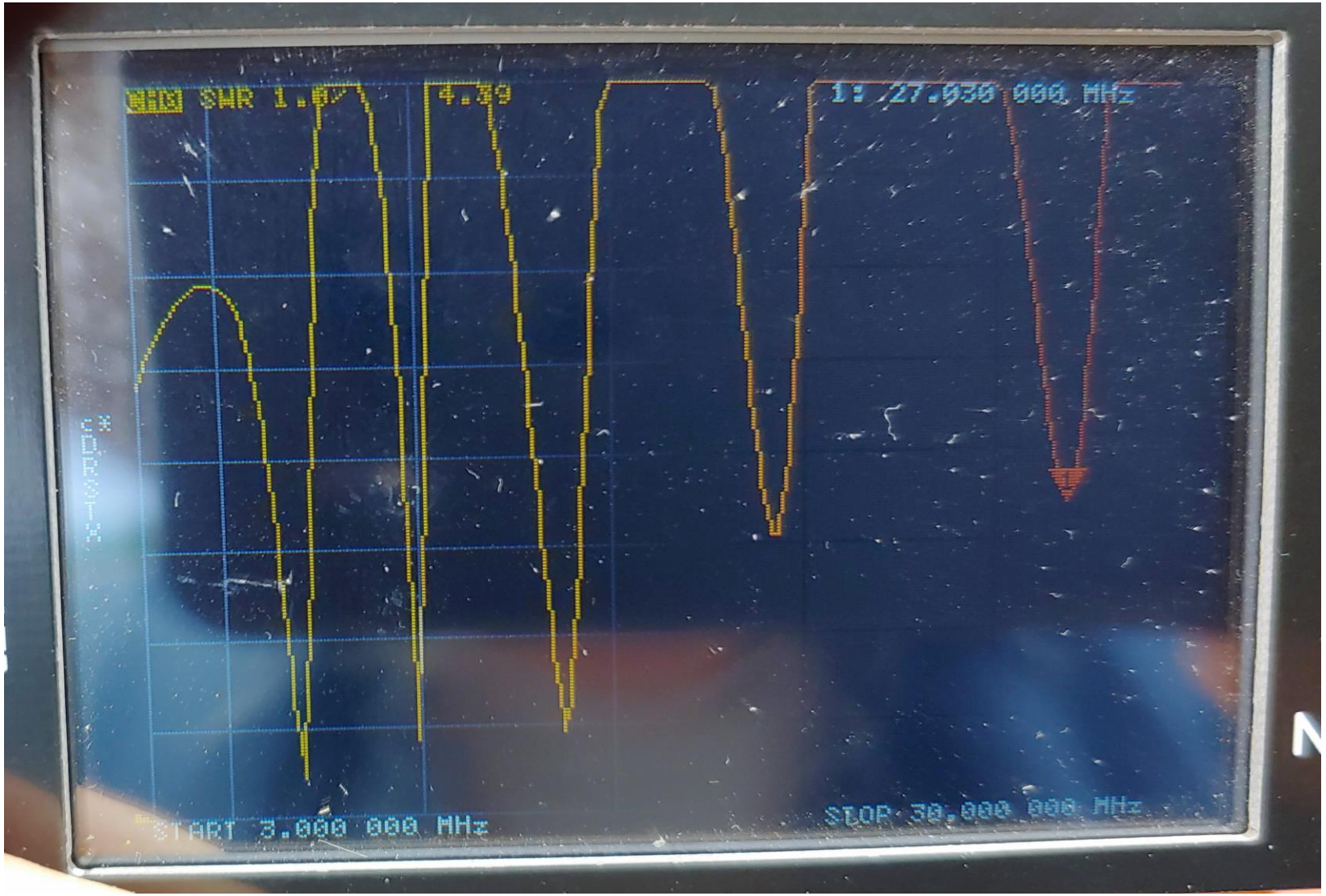
Stealth 3 band: around 15m dip

AC9UV



Stealth 3 band: around 10m dip

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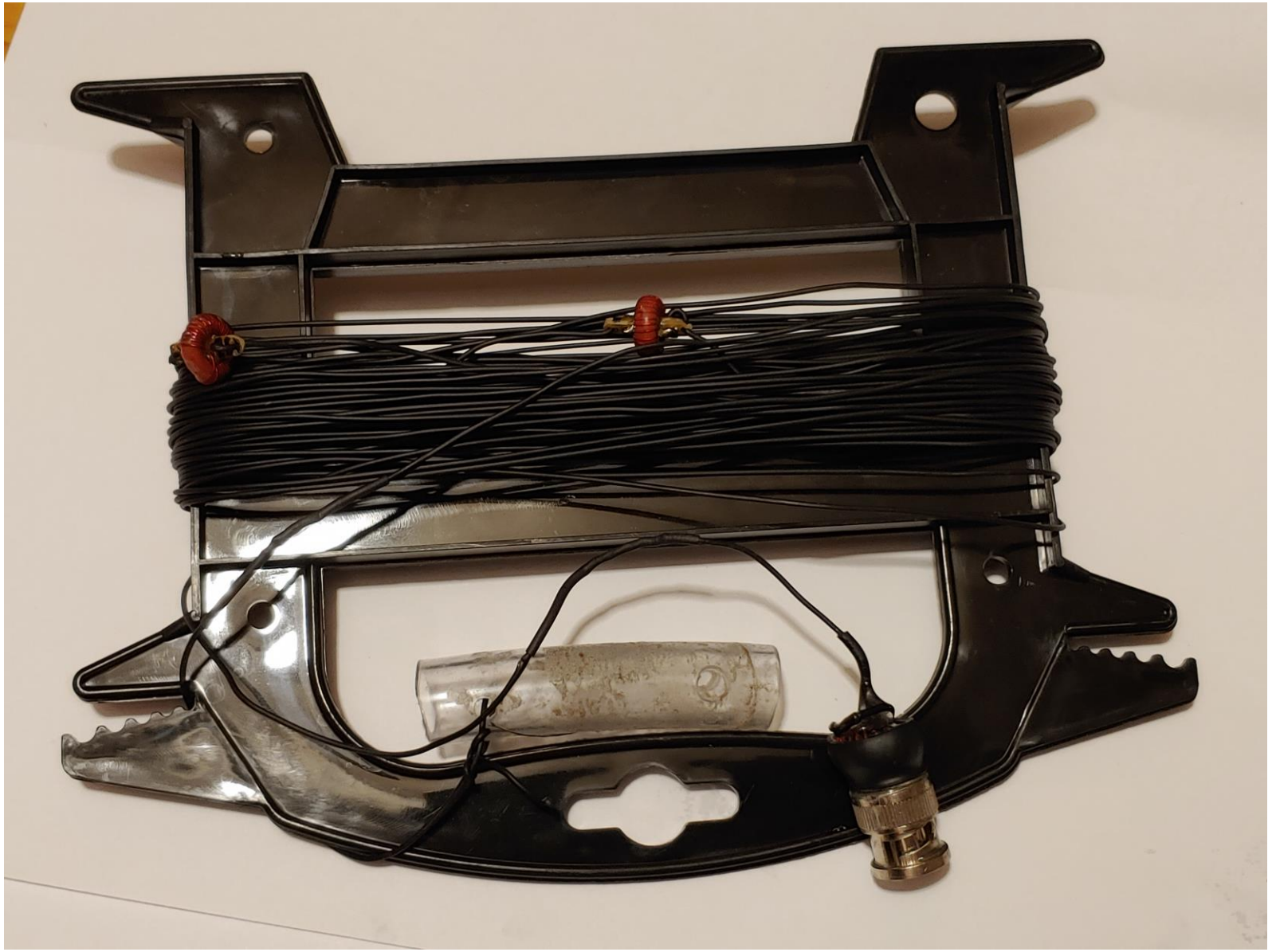


Ready to Go

AC9UV

ARRL Multi Band End Fed

Build an End-Fed Half-Wave Antenna From a Kit

Project by Frank Bontenbal, PA2DKW
Process photos by Bob Inderbitzen, NQ1R

Please note: This kit is available from **ARRL**. The original assembly instructions are available from the manufacturer, **HF Kits**.

To help new hams prepare for the exciting world of HF opening up during Cycle 25, ARRL has partnered with HF Kits to bring you this easy-to-build four-band antenna kit: an end-fed half-wave (EFHW) antenna. Unlike the dipole antenna, which is

AC9UV

ARRL EFHW Antenna

This antenna works for 10, 15, 20, and 40 meters,

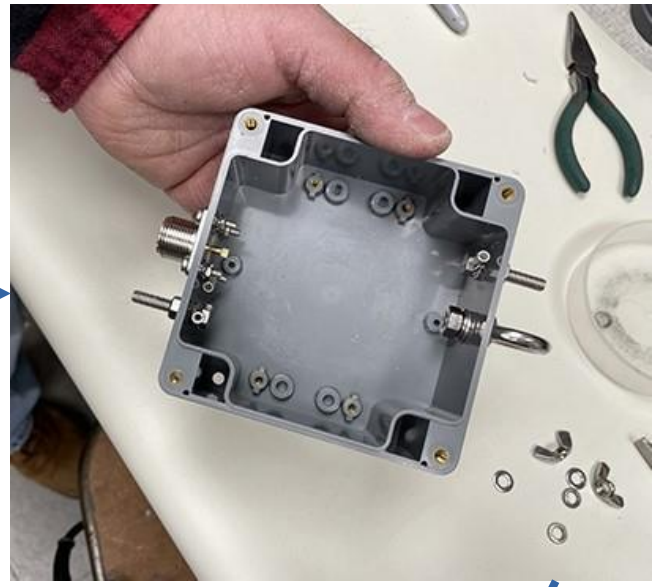
has a very high impedance of around 2,500 Ohms.

The kit includes the parts needed to construct a 49:1 impedance matching network,which will transform the impedance to 50 Ohms

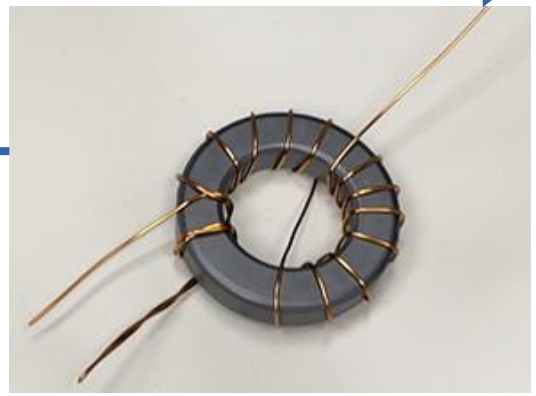
ARRL EFHW Antenna

Take Parts

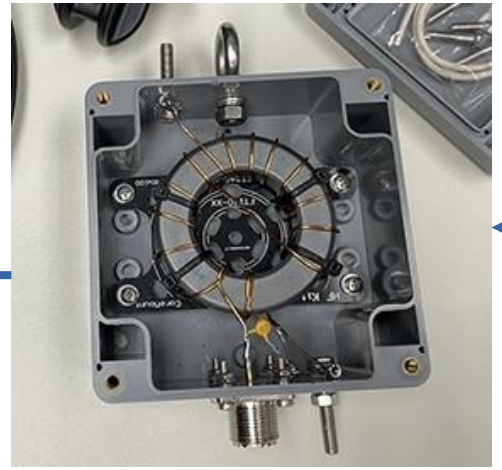
Drill Holes



Mount Hardware



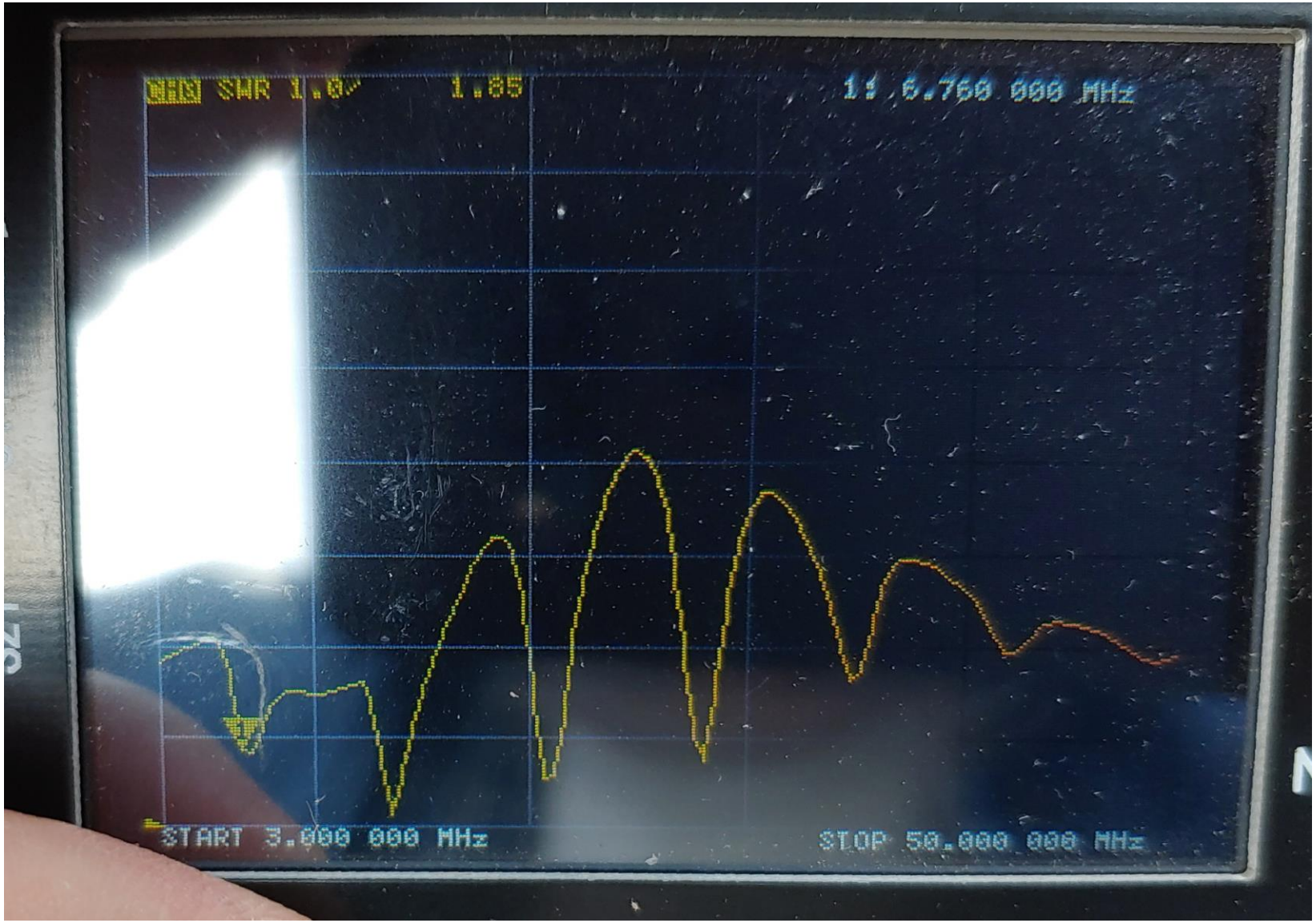
Wind Transformer



Mount Trans and Cap

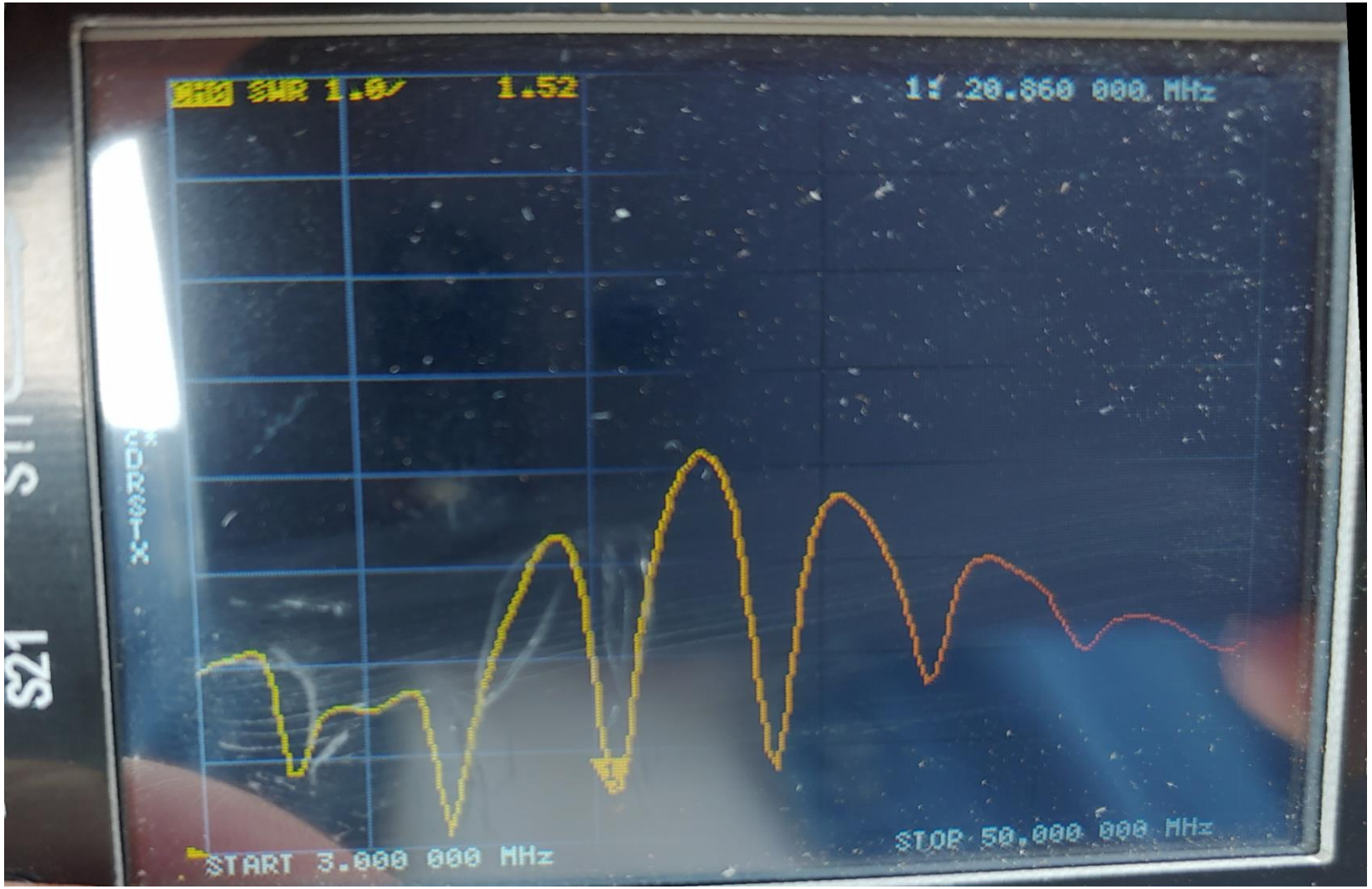
Keep on Haming

AC9UV



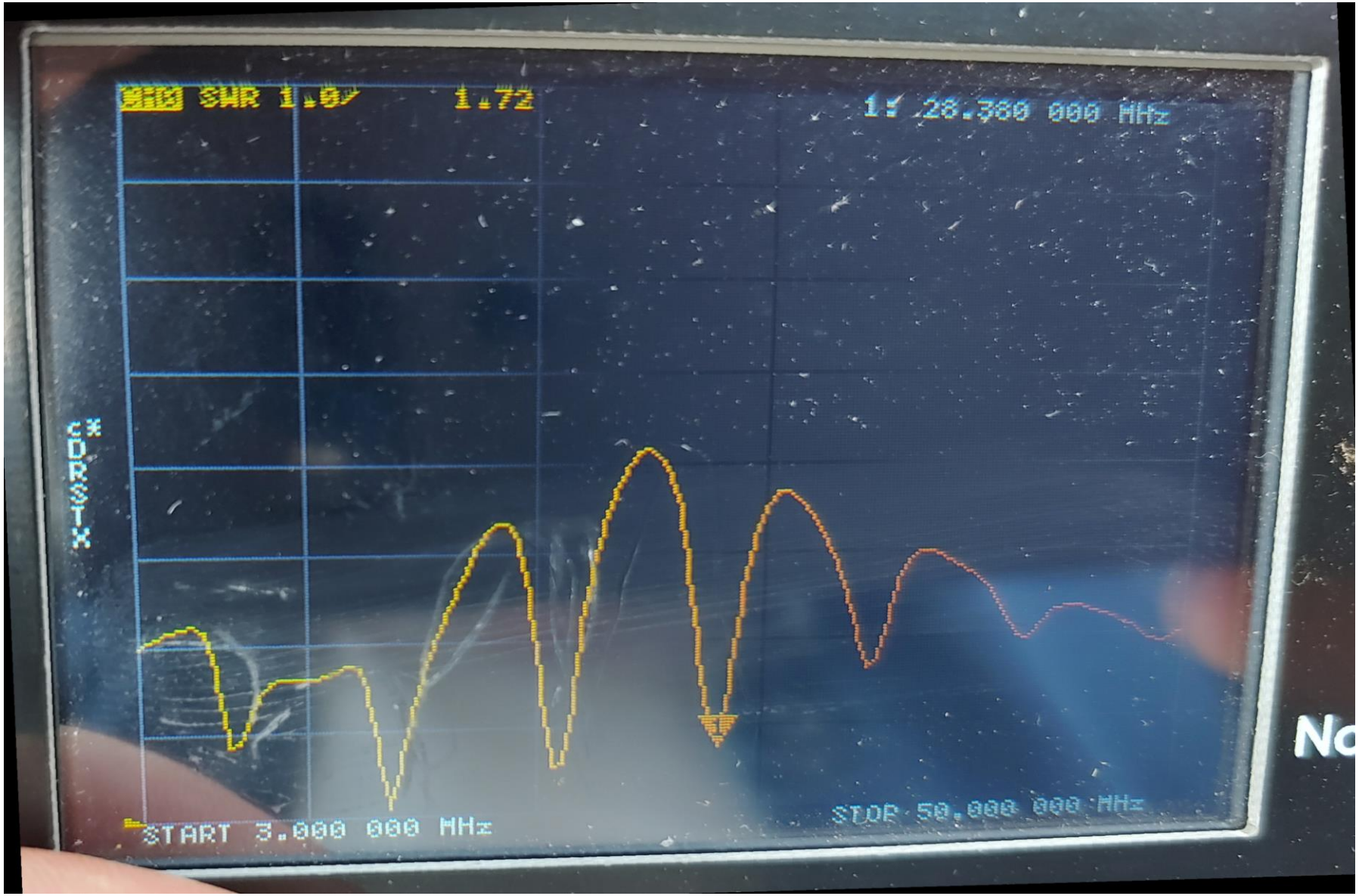
ARRL EFHW: 40m dip

AC9UV



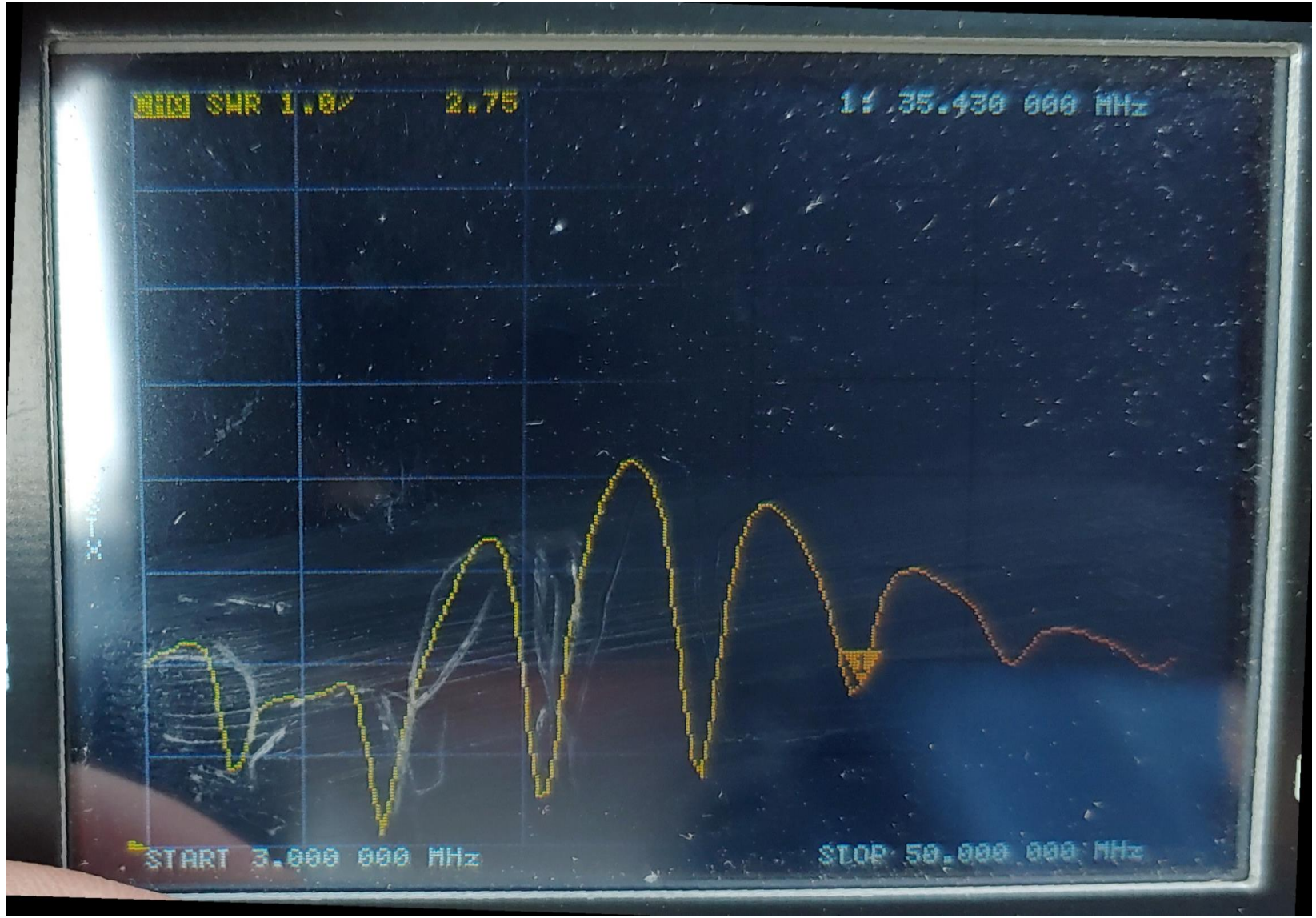
ARRL EFHW: 15m dip

AC9UV



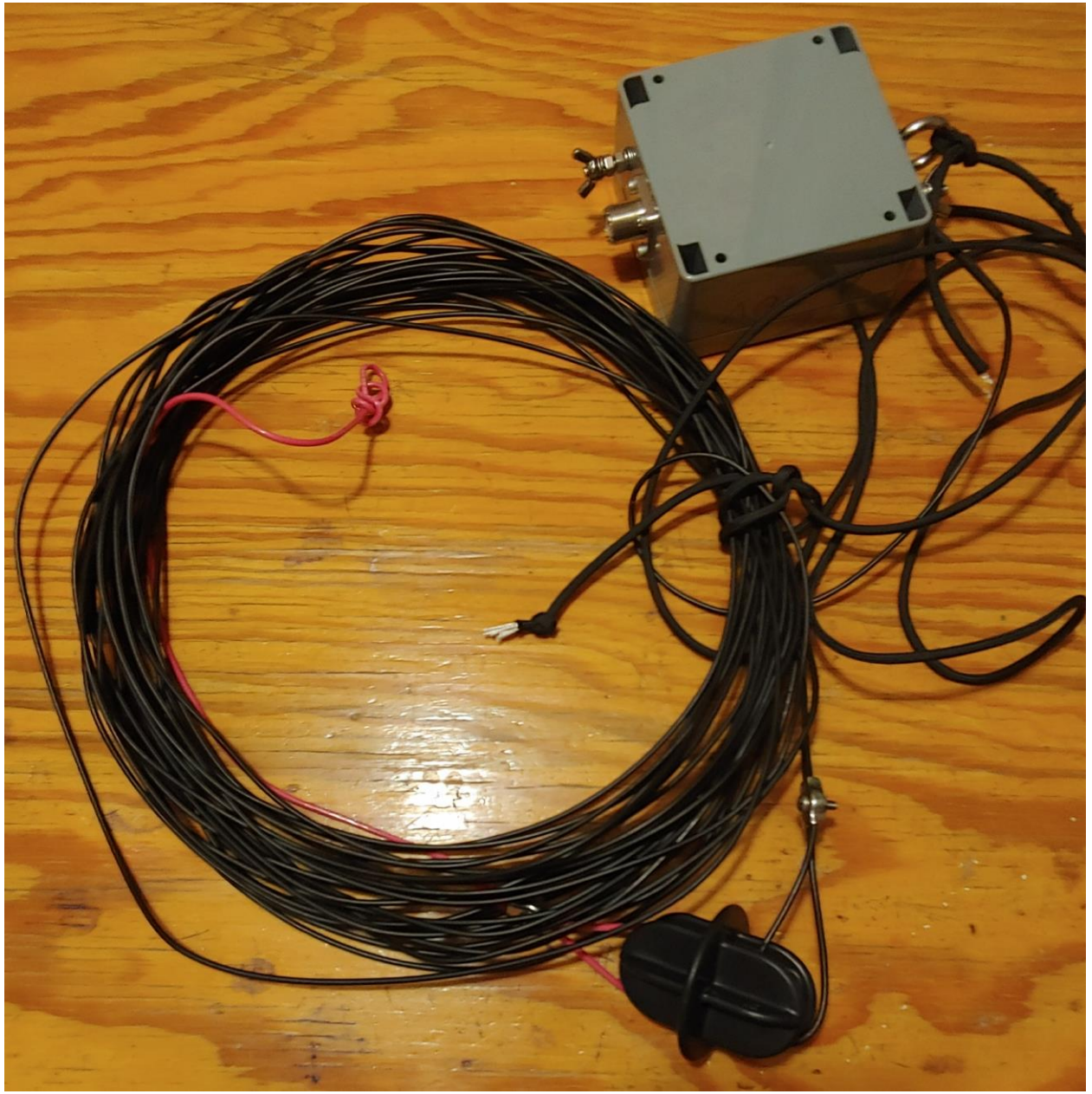
ARRL EFHW: 10m dip

AC9UV



ARRL EFHW: 35mhz dip

AC9UV

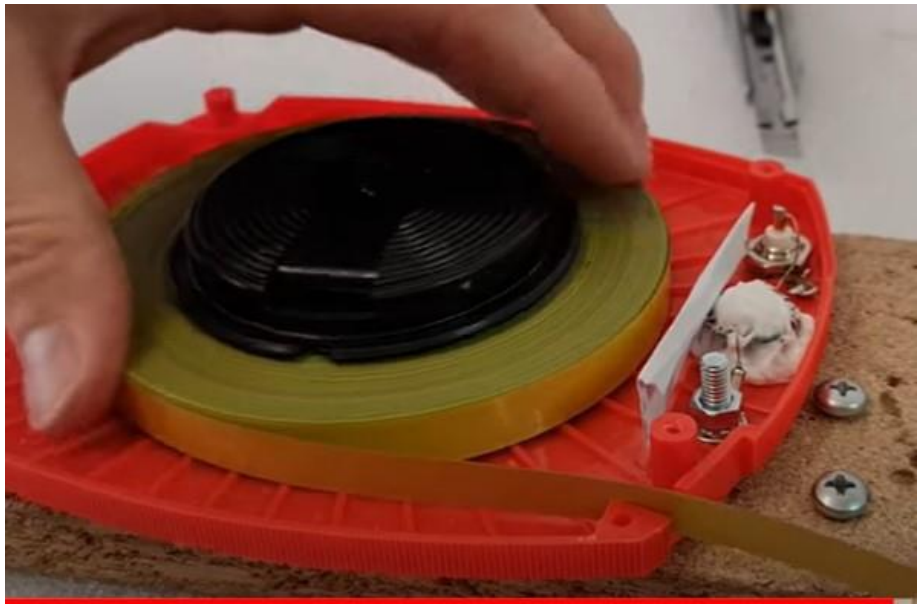


We used it in Field Day for QRP

AC9UV

Paul OM0ET EFHW Tape Measure Antenna

AC9UV



Idea From:

https://www.youtube.com/watch?v=pEI5K-j1Koo

https://www.youtube.com/watch?v=J7O6hOuRixQ&t=0s

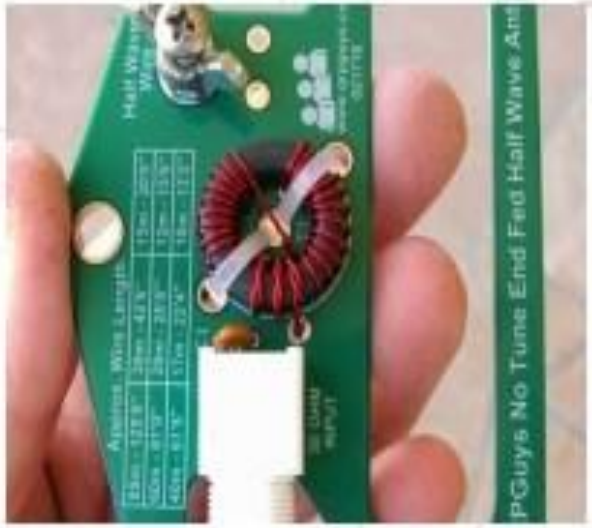
Simpler build (kit)

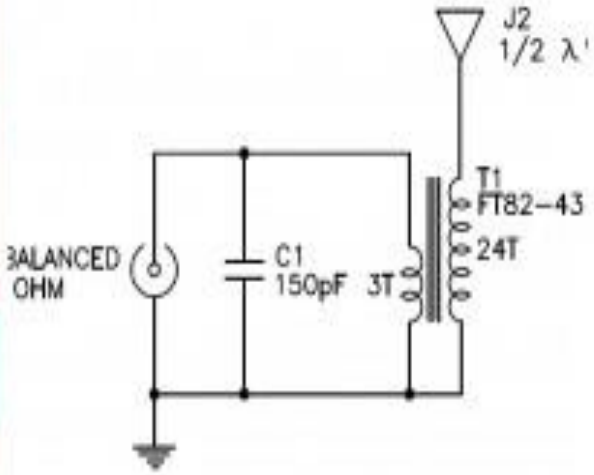
my tape measure did not have enough space for parts integration

QRPGuys Portable No Tune End Fed Half Wave Antenna

https://qrpguys.com/qrpguys-end-fed-wire-antenna

AC9UV





QRPGuys no tune EFHW transformer

Just add the proper half wave length and go. (or role out the tape measure to the proper length. Then Reel it back in!!!!!

AC9UV

80m - 125'0"	30m - 42'6"	15m - 20'0"
60m - 81'0"	20m - 28'8"'	12m - 15'6"
40m - 61'6"	17m - 22'4"	10m - 13'2"

Wire Lengths for different Bands for EFHW transformer

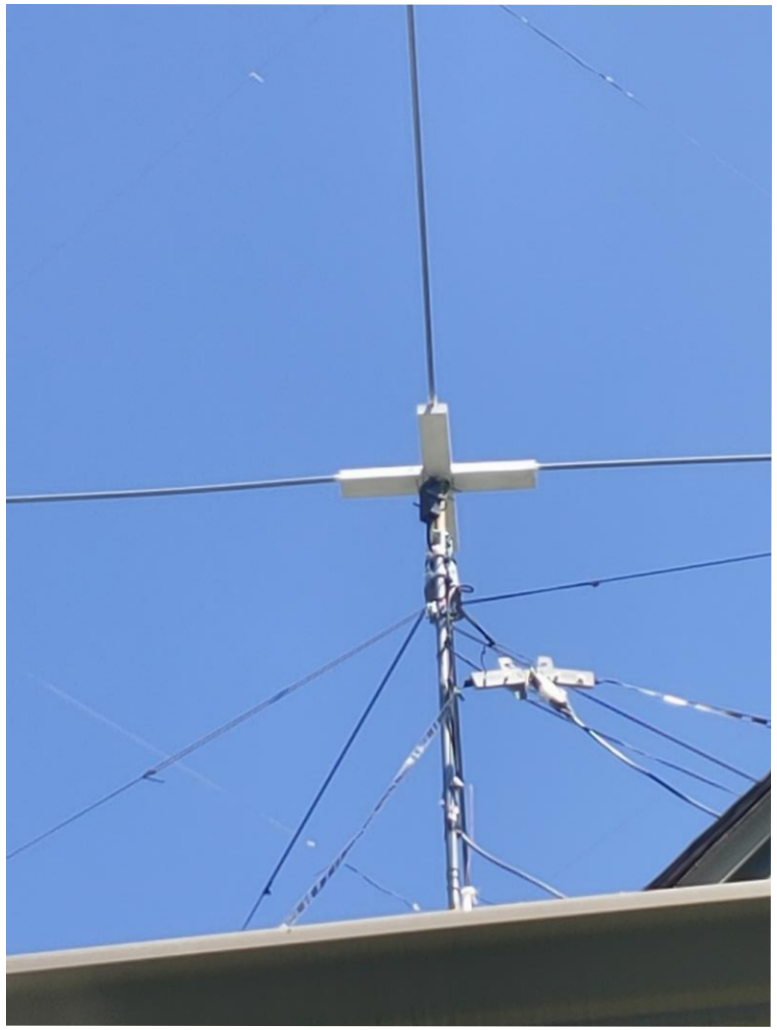
AC9UV

Tape Measure Antenna yet to be measured and used.

AC9UV

My home setup, above and below.

My 4 roof antennas



10m Xbeam and 40m folded dipole

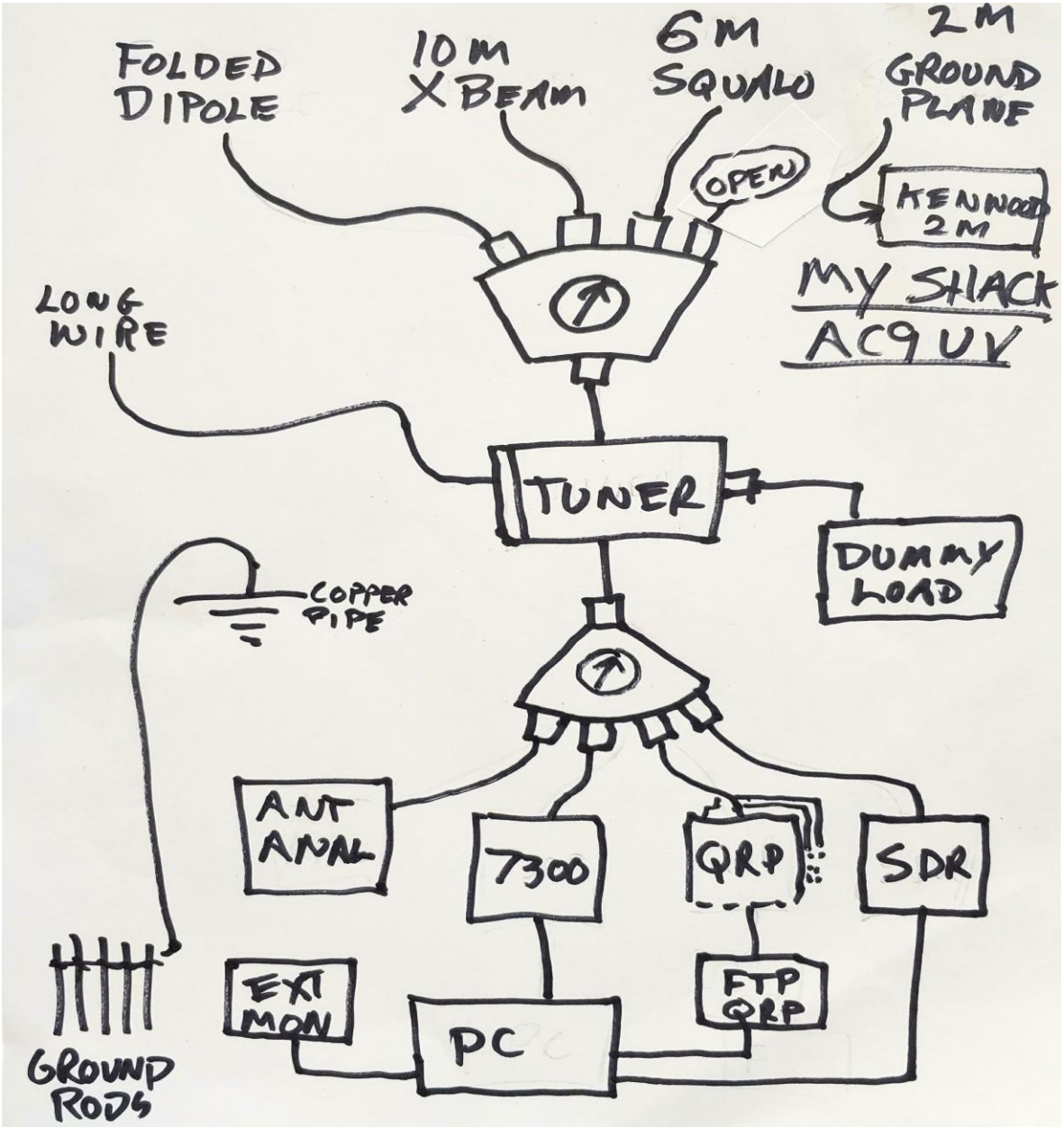
2m ground plane

6m Squalo

AC9UV

Now for some antenna/roof safe fun!

AC9UV



My Shack logical layout:

4 antennas 2 main radios

Switched to the tuner (Alpha Delta switches)

Tuner to a switch to various radios and Ant Analyzer

A copper pipe backplane to the table that radios are hooked up to, and a galvanized plate under a rubber surface on the table top (grounded)

5 ground rods just 6 ft away all connected together

A pc with external large monitor with internet access

The Antenna analyzer is a youkit

The long wire just goes out the window and up the side of the house. Used with a qrp eliminator

YOU CAN DO IT!

- Build vs Buy decision
- Expectations of performance, do you need to be the best?
- The learning experience.
- Test equipment, does not have to be very expensive now.
- Patience, focus, and (googly eyes help)

Build and Testing equipment

- Soldering Iron(s), stand, brass scrubber, tip tinner, solder braid, solder sucker.
- Solder
- Wire Stripper
- Wire Cutter
- Screwdrivers, plyers,…
- Antenna analyzer
- Magnifying glass/goggles
- Multi meter, component tester,…
- Drill, drill bits, cone cutter, vice...

Soldering

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Basic Tools

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Vision Tools

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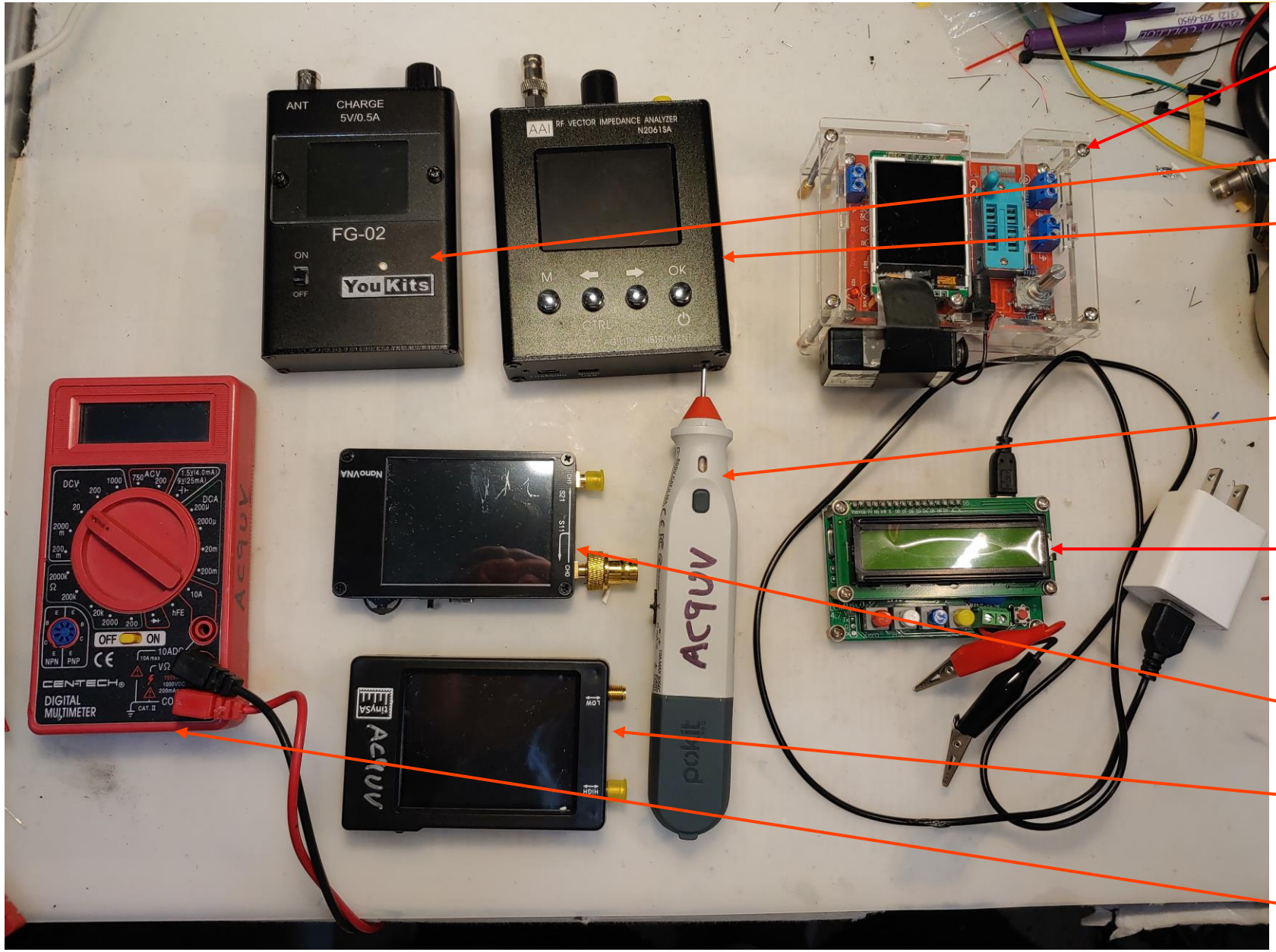

Trans. Tester, LCR $18

Youkit Ant. Anal. $259

Vector Network Analyzer ~$100

Measurement Tools

Pokit pro $225

LC meter $16

NanoVMA $48

TinySA $70

Harbor Freight $7

AC9UV

Tools Glue and stuff

AC9UV

Tools basic and fancy

AC9UV

Tools Shrink and glue

AC9UV

Tools, most important, Lids

AC9UV

WORKS CITED AND LINKS

- Ten for 10, Michael Harris KM4UL
  - Double Delta: https://vimeo.com/533227173
  - https://www.youtube.com/watch?app=desktop&v=XqkwOBOpSO4
- Folded Dipole:
  - Amateur Radio HF Antennas: Book Two: HF Antennas For Limited Space:Claude Jollet, VE2DPE
  - ARRL Small Antenna's for small places:Steve Ford WB8IMY
- Squalo:https://www.qsl.net/kp4md/50_mhz_halo.htm
- Double Delta
  - Double Inverted HF Delta Skeleton Slot Antenna, John Portune W6NBC: https://vimeo.com/533227173
- Off Center Dipole: one source: https://www.dj0ip.de/off-center-fed-dipole/
- 3 band Trapped Stealth:
  - https://www.youtube.com/watch?v=s-_LyhdGapM&t=1079s
  - https://www.youtube.com/watch?v=s-_LyhdGapM&t=1079s
- Tape Measure Ant:
  - https://www.youtube.com/watch?v=pEI5K-j1Koo&list=RDCMUCy7btBpJl8olJlBu3c87eog&index=1
  - https://www.youtube.com/watch?v=J7O6hOuRixQ&t=0s