JUNE 2020 Volume 9 Issue 6

VE3ERC-LUB

President: Brian VA3DXK
Vice-President: Ted VE3TRQ
Secretary: Tom VE3DXQ
Treasurer: Paul VA3PDC
Trustee: Wes VE3ML
QSL Manager: Tom VE3DXQ
Repeater Trustee: Wes VE3ML
Website Admin: Ted VE3TRQ
Lighthouse: Al VA3TET
Maple Syrup Display: Al VA3TET
Newsletter: Bob VE3IXX

ERC REPEATERS

UHF 444.700 TONE: 131.8
UHF 444.700 TONE: 123.0
VHF 147.390 + TONE: 123.0
EMERGENCY SIMPLEX: 147.51
UHF– IRLP node 2404
VHF– IRLP node 2403, ECHOLINK node
VE3ERC-L VE3ERC-R

In an emergency, tune
Into our repeaters,
UHF 444.700 or
VHF 147.390 or
HF 3.755 LSB or
Simplex 147.510
For coordination and assignments.

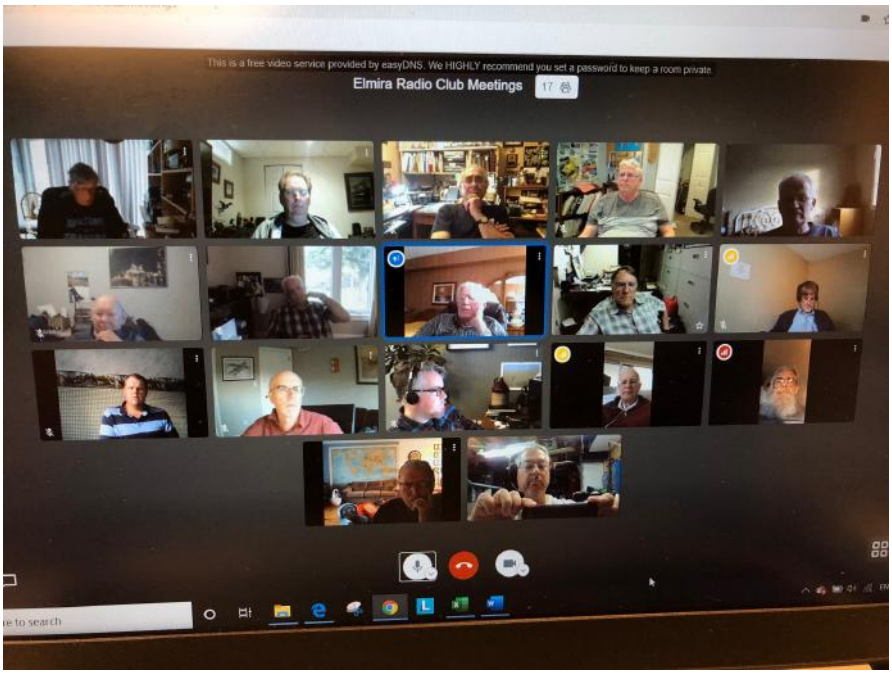
Tony VE3DWI didn't let any pandemic stop him from adding more antennas to his tower in Kitchener. Material for a future newsletter?

THE PREZ SEZ!

This club is Radio-ACTIVE

President's Update for June 2020

Thanks again go out to Ted VE3TRQ for arranging our online video club meeting which was held on June 24. As you can see from the screen picture below, it was a great success with 17 members participating. The minutes are posted in this newsletter.



Also please note that Radio Amateurs of Canada is offering another Advanced Qualification Amateur Radio Course that will offer one of two options. One course will start Sunday afternoon on July 5. The other option is a course starting Monday evening, July 6. For more information check the website at

https://www.rac.ca/amateur-radio-courses/advanced-course-for-maple-leaf-operators/

RAC is also in the process of starting another Basic Qualification Amateur Radio Course which will begin about mid August. Check the RAC website to keep posted on further information.

www.rac.ca

'73 Brian VA3DXK

CONTRIBUTIONS TO VE3ERC-CLUB NEWSLETTER

Do you have an article you'd like to submit? Or photos? Do you have any comments you'd like to make?

Perhaps you'd like to share a photo of your shack, a special project you are working on or a special interest!

SEND THEM TO:

Bob bobve3ixx@gmail.com

(519-787-2279)

WEDNESDAY NITE NET CONTROLLERS

JUNE 10 - KIRK VA3KXS

JUNE 17 - REG VE3RVH

JUNE 24 - VIRTUAL MEETING

JULY 1 - FRANK VA3FJM

JULY 8 TOM VE3DXQ

JULY 15 - BILL VA3QB

JULY 22 - WES VE3ML

JULY 29 - PAUL VE3PVB

AUGUST 5 - AL VE3DZZ

AUGUST 12 - BRIAN VA3DXK

AUGUST 19 - BOB VE3IXX

AUUST 26 - TED VE3TRQ

SEPTEMBER 2 - AL VA3TET

First Face to Face Coffee Meeting

In Over Three Months

The Elmira Radio Club members enjoyed their first coffee get-together at Gore Park in Elmira on Wednesday morning of June 17.

Thanks to Tom VA3VRA for the pictures.

Links

Ontars— **www.ontars.com**

Elmira Radio Club— **www.ve3erc.ca**

Trans-Provincial Net - **http://tpn7055.com/**

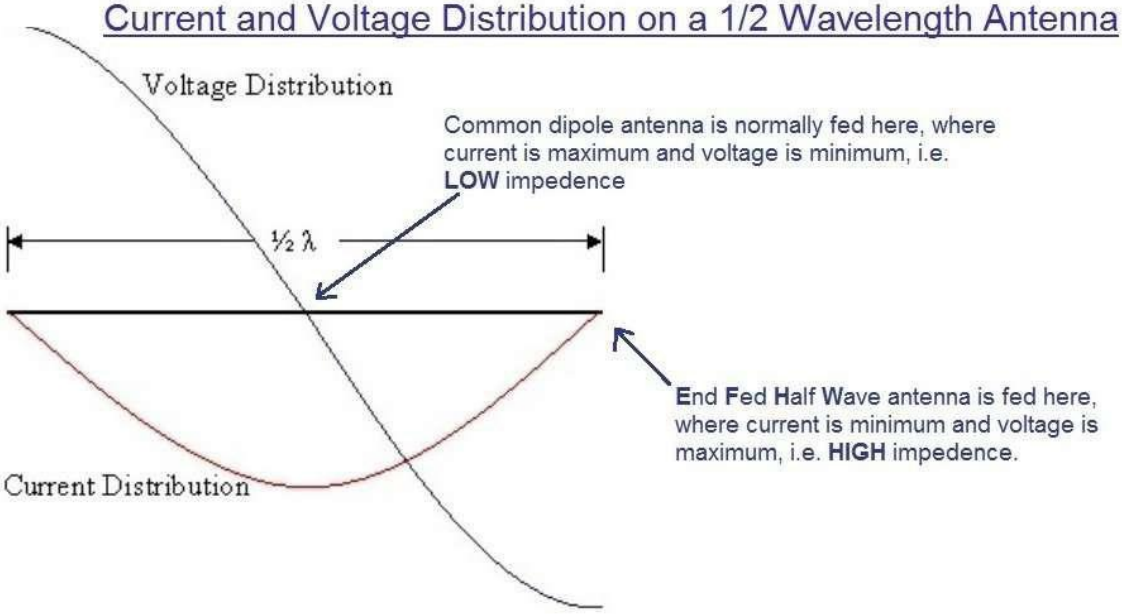
Radio Amateurs of Canada— **www.rac.ca**

KW Amateur Radio Club - **www.kwarc.org**

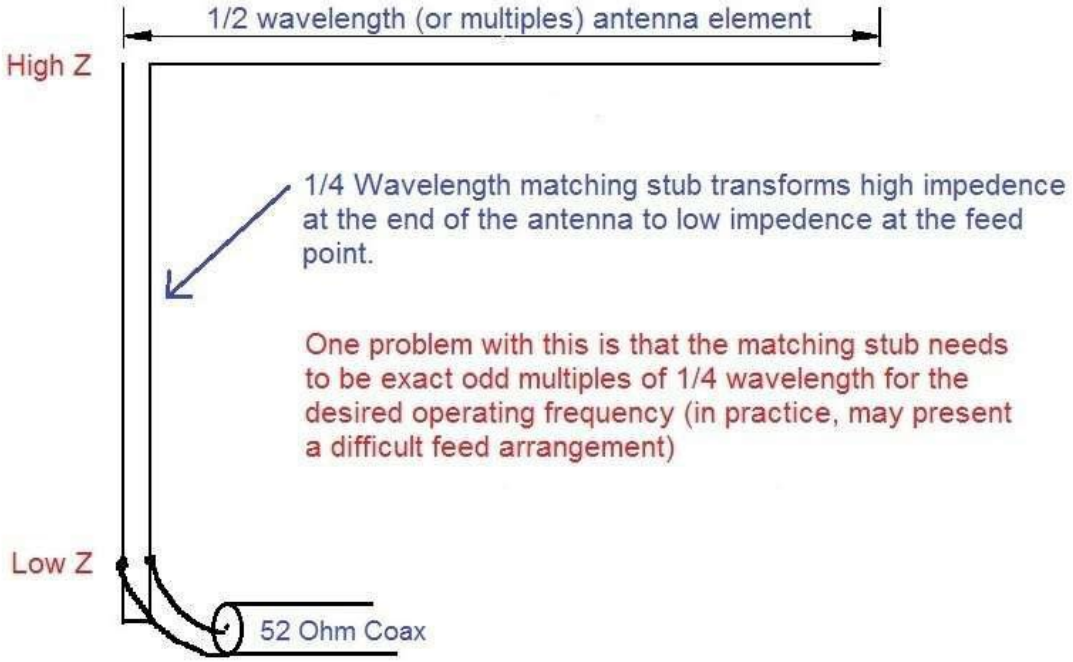
Guelph Amateur Radio Club— **www.garc.ca**

When considering the End Fed Half Wave antenna, it is beneficial to keep in mind this fundamental principle of a half wave radiator...

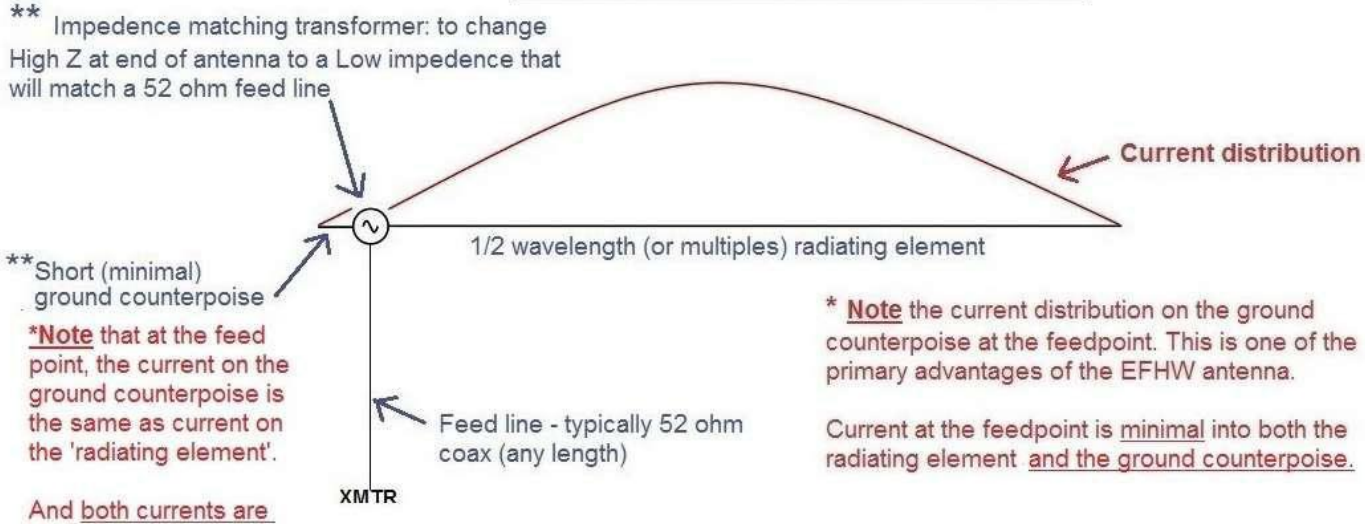
Current and Voltage Distribution on a 1/2 Wavelength Antenna



An End Fed Half Wave antenna is similar in principal to that of the End Fed Zepp Antenna



Basic End Fed Half Wave Antenna



Advantages

1. Conveniently fed from one end of the antenna (typically within a few feet of the ground), yet the high current point (max antenna radiation) is 1/4 wavelength up the antenna

2. Requires only a minimal ground counterpoise...either a short length of wire or a portion of the coax shield will suffice. (Cushcraft verticals are an example of 1/2 wave end fed antennas that operate efficiently with only minimal ground requirement)

3. Also resonant at frequencies that are multiples of 1/2 wavelength

Matching Transformer for an EFHW Antenna

Practical impedance at the end of a 1/2 wavelength antenna is typically in the range of **2000** to **4000 ohms**

So for example, if the antenna impedance was **2450 ohms** you would need a **matching transformer with a transformation ratio of 49 to 1** in order to match to a 50 ohm feed line impedance.

Similarly an antenna with **3200 ohm** impedance would require an impedance transformation ratio of **64 to 1**

EFHW matching transformers are usually wound for one of the impedance transformation ratios noted above.

Note that this is completely different from the case of the 9:1 matching transformer used with a random length end fed antenna, which is made so as to be purposely **not a 1/2 wavelength** on any frequency. Impedence at the end of a random length antenna is typically only ~450 ohms (hence the use of a 9:1 transformer).

Calculating Matching Transformer Turns

Transformation Ratio = (Turns Ratio)^2

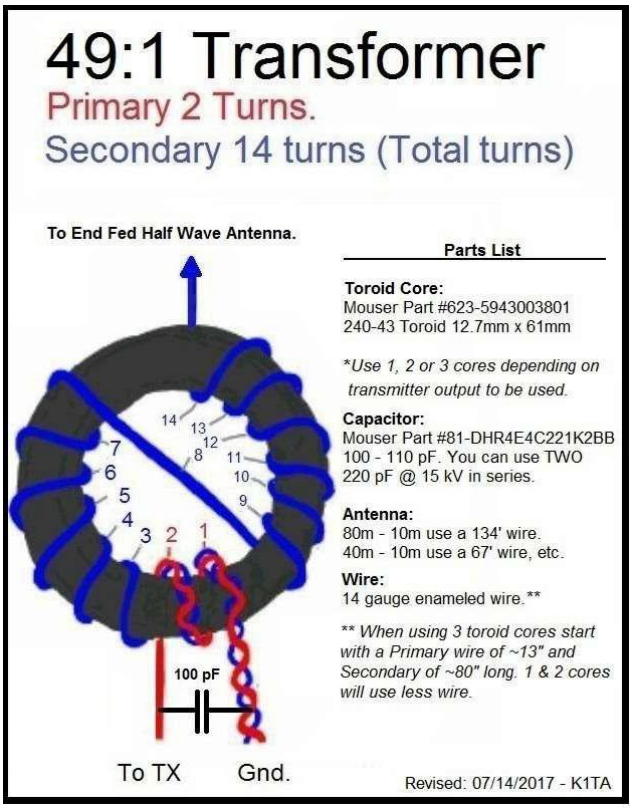
e.g. Secondary = 14 Turns, Primary = 2 Turns

-> Turns Ratio = 7:1

-> Impedance Transformation Ratio = 49

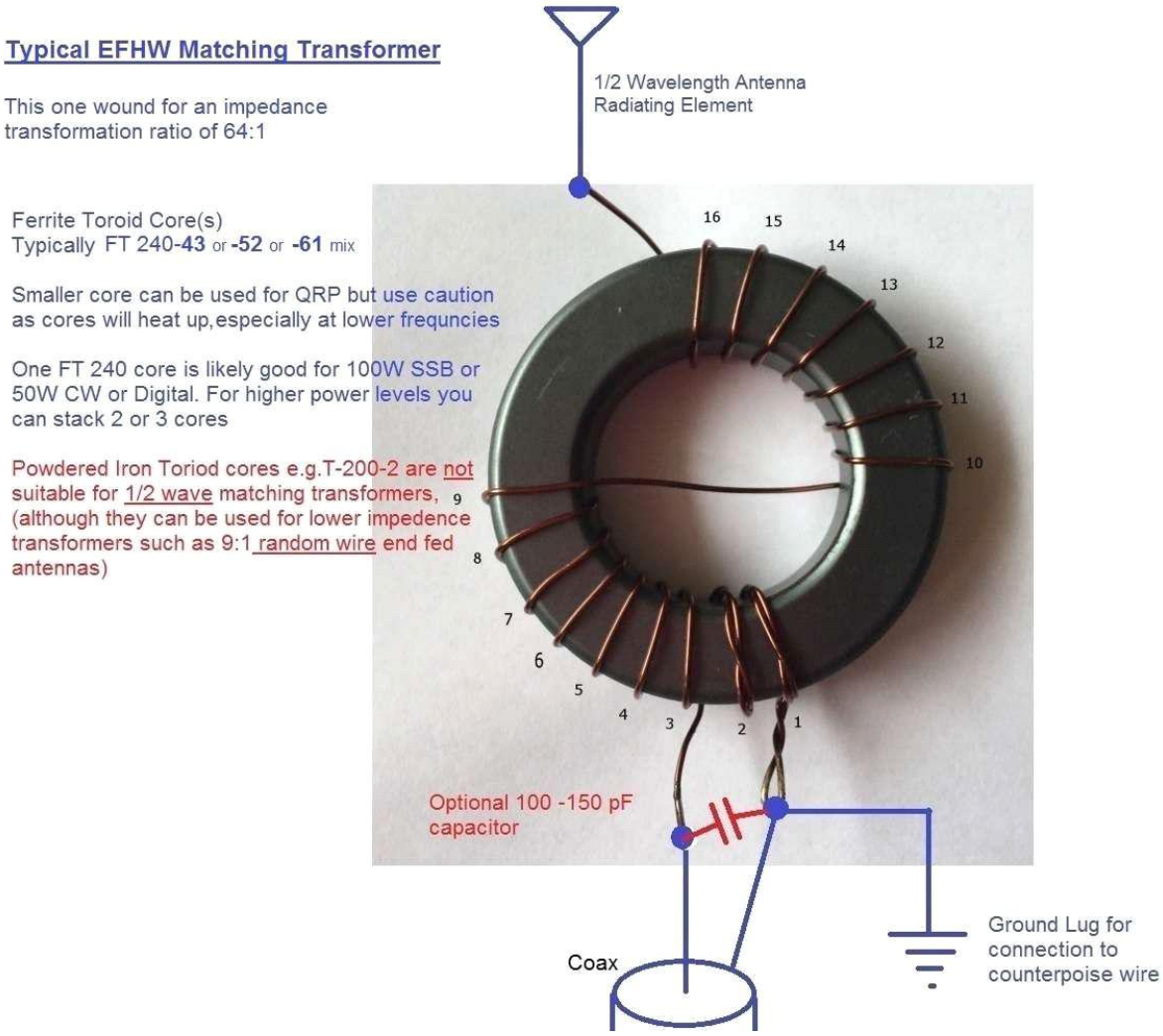
This matching transformer would bring an antenna impedance of 2450 ohms down to an impedance of 50 ohms (2450 / 49 = 50)

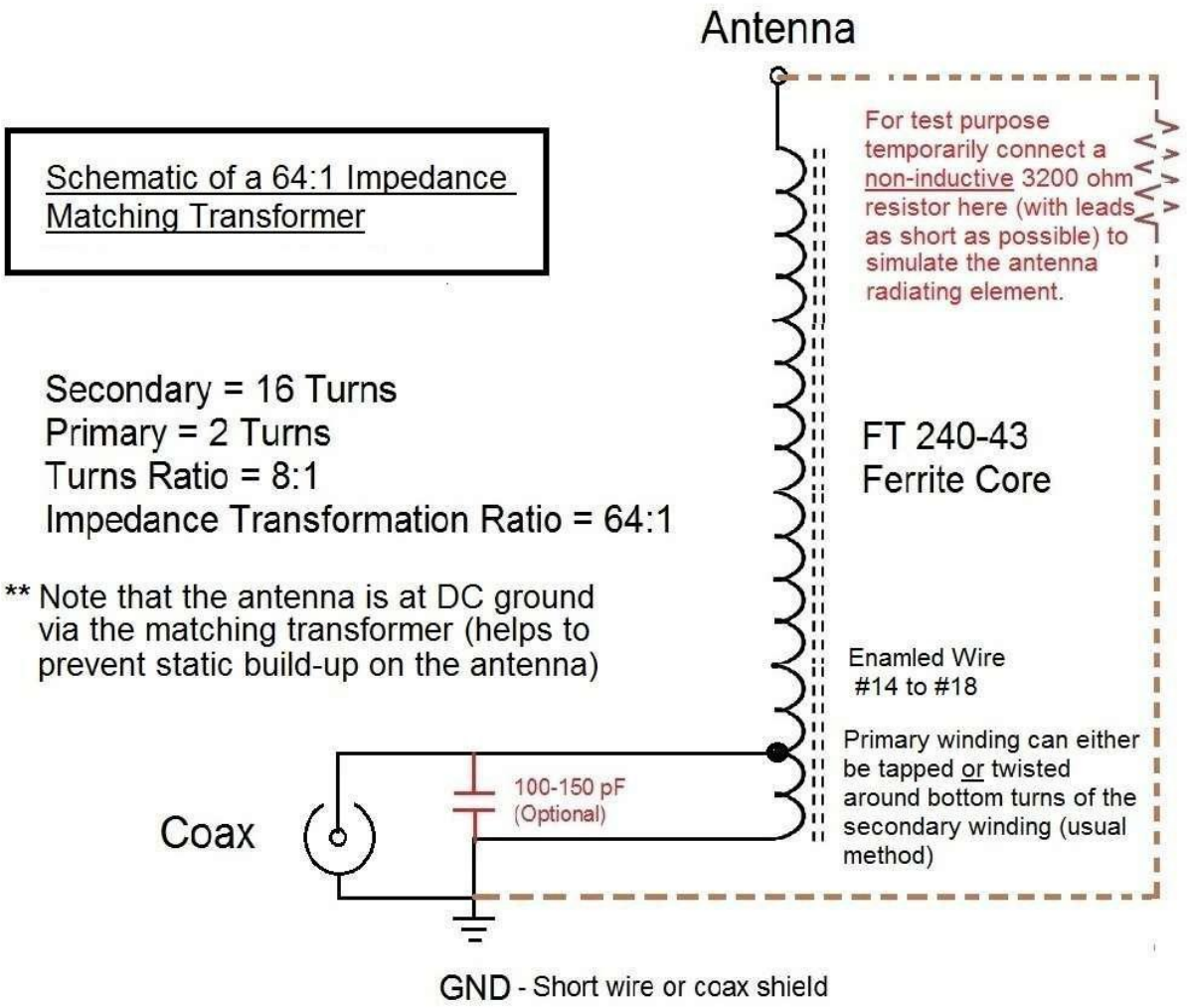
Note that when winding toroids, each time the wire passes through the toroid counts as one turn.

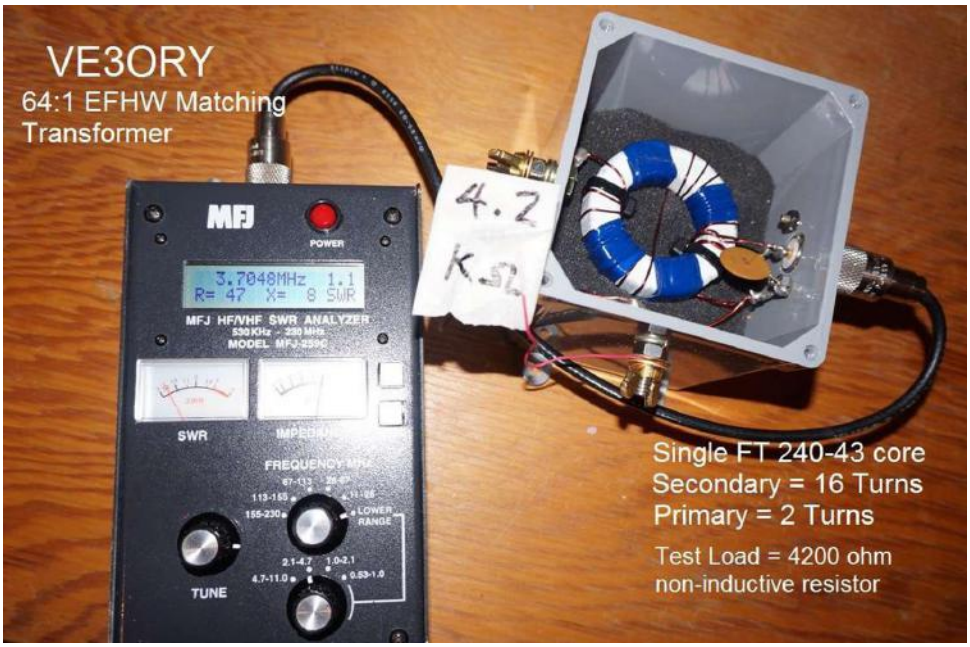


You will find this diagram by K1TA on numerous web sites.

It is a ood reference when trying to remember how to wind an EFHW matching transformer.

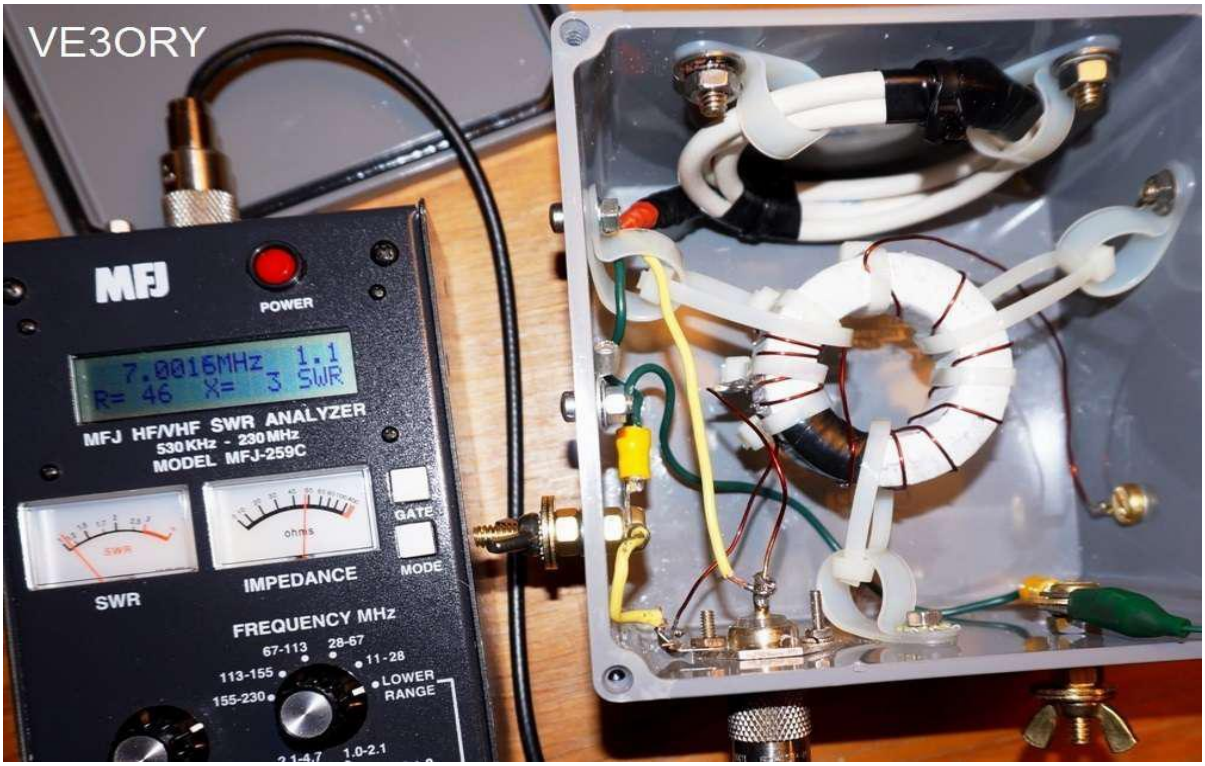




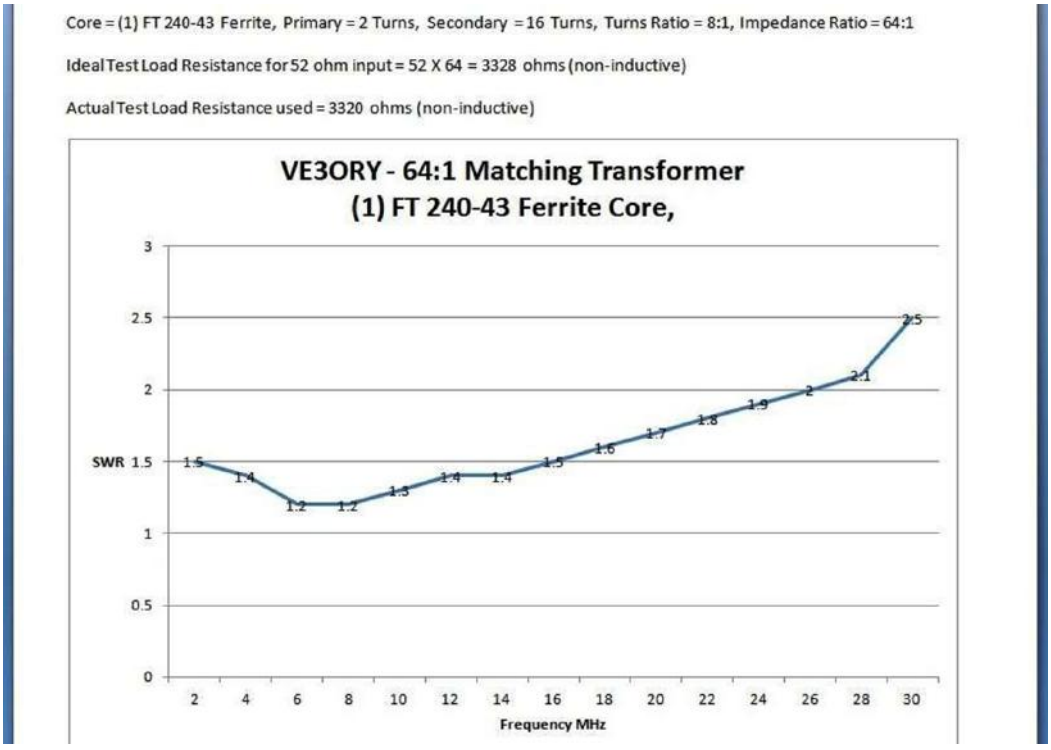


Testing one of my single core transformers using a 4200 ohm resistive load to simulate the impedance of a ½ wave radiating element. This is a good way to asses characteristics of the transformer across the intended frequencies. The disk capacitor helps offset the tendency for SWR to increase at higher frequencies due to inductance of the transformer windings.

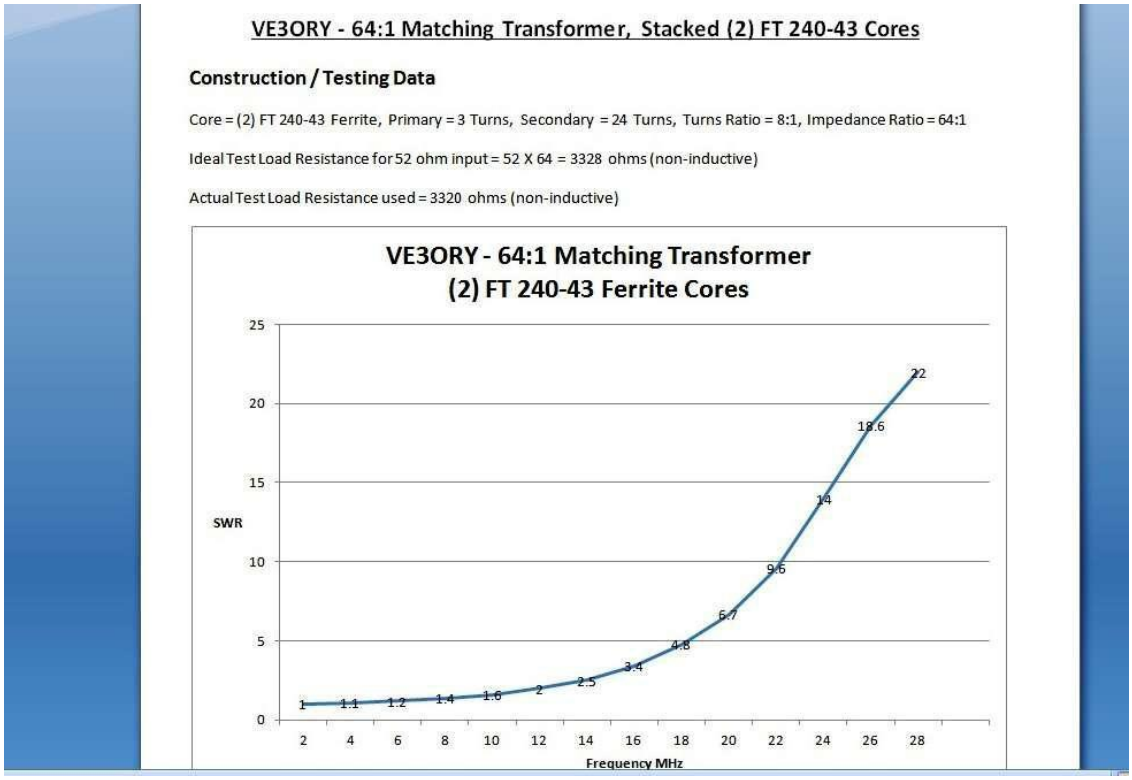
For this transformer I experimented with using a piece of coax cable to provide the capacitance across the input windin. You can do without this capacitor if your antenna is targeted for the lower bands (80/40m) and you don't care so much about SWR increasing at the higher frequencies. Also keep in mind that this capacitor sees your full transmitter output so important that it be appropriately rated for the intended power levels.



Here is a plot of SWR for one of my transformers taken using an MFJ-259C antenna analyzer. Fairly pleased with this one, as the SWR is less than 2:1 across most of the HF band. I have found it relatively easy to obtain good results when winding on a single core. It seems to become more difficult when stacking multiple cores for purposes of better power capability. I think in theory due to resulting higher inductances.

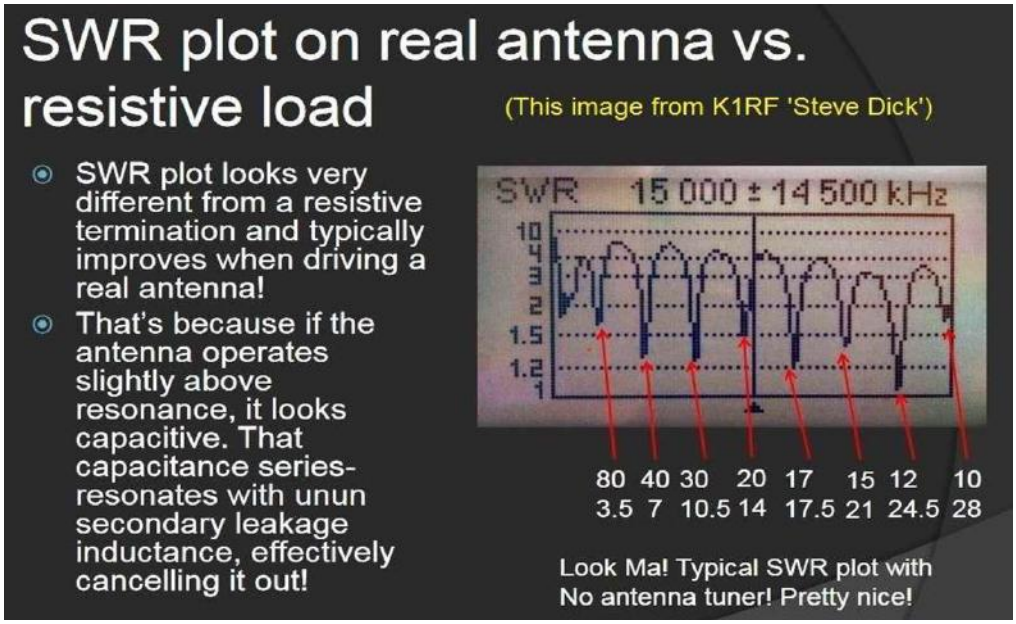


Here is an example of what I mentioned in the previous slide. This transformer wound on a stacked pair of FT 240-43 cores. The SWR rises very quickly at the higher frequencies. The 100 pF capacitor on the input winding will not fully offset this tendency. Different core mix will make a difference. Note also for this one I chose to use a 3-turn primary and 24-turn secondary which likely compounded the problem at higher frequencies. There is still a lot of 'black art' magic about these transformers that I don't yet fully understand.



Keep in mind that the previous SWR plots shown were only looking at performance of the transformer itself, using a resistive load to simulate an ideal antenna connected to the output terminal. The real-life situation is a lot different. Primarily due to the fact that, as you change frequency on the antenna, it is in reality no longer an exact ½ wavelength, and impedance at the end of the antenna will decrease rapidly. The matching transformer is then 'over-compensating' and the result is that SWR rises rapidly as shown in the SWR plot here.

It is. also for this reason that it can be difficult to get an EFHW antenna to operate on multiple bands where the higher frequencies may be close to, but not exactly, a ½ wave multiple of the lowest fundamental. frequency that the antenna was tuned for. There are other tricks that can be used to offset this tendency (as used in some of the commercially produced EFHW antennas).



Core Material Data from K1RF, Steve Dick

EFHW Single FT-240 Unun 3T different materials.xls [Compatibility Mode]

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	This EFHW core loss data generated by Steve Dick, K1RF based on on-line calculators available on owenduffy.net														
2	Computations of EFHW UNUN using different toroid core materials, number of toroids, and number of primary turns (2 or 3)														
3	Losses in the matching transformer are only part of the total system loss, and overall system efficiency will be lower than estimated here for the transformer alone														
4	Using calculator at:	https://owenduffy.net/calc/toroid.htm		assumed 2pF Cs in the calculator											
5	and an example of computing core efficiency at:														
6	https://owenduffy.net/blog/?p=12578														
7															
8	This table was generated for a single FT-240 size toroid with 3 turn primary (for use with 21-24 turn secondary)														
9	For a given material. The primary inductance for a three turn primary is 9/4 that if two turns, but Al is half that of two FT-240s.														
10	Therefore primary indctance for a single core with 3 turn primary is only about 1.125 the unductance of a two turn primary with two cores.														
11	However, the efficiency of a three turn primary has far lower core losses than two turns for the same number of cores and material.														
12	A three turn primary should likely work fine even at 28 MHz for a single FT-240 core.														
13															
14	Core efficiency tables for a single DFT-240 size core with different core materials for a three turn primary:														
15	This is assumed to be used for a 100 watt class transmitter. Assume 125 watts max and 44% duty on CW, or 55 watts average output power.														
16	Green = efficiency >90% and core power dissipation <6.5 watts (assumption)														
17															
18	FT-240 parameters: A=OD-61mm, B=ID=35.55mm, C=width = 12.7MM														

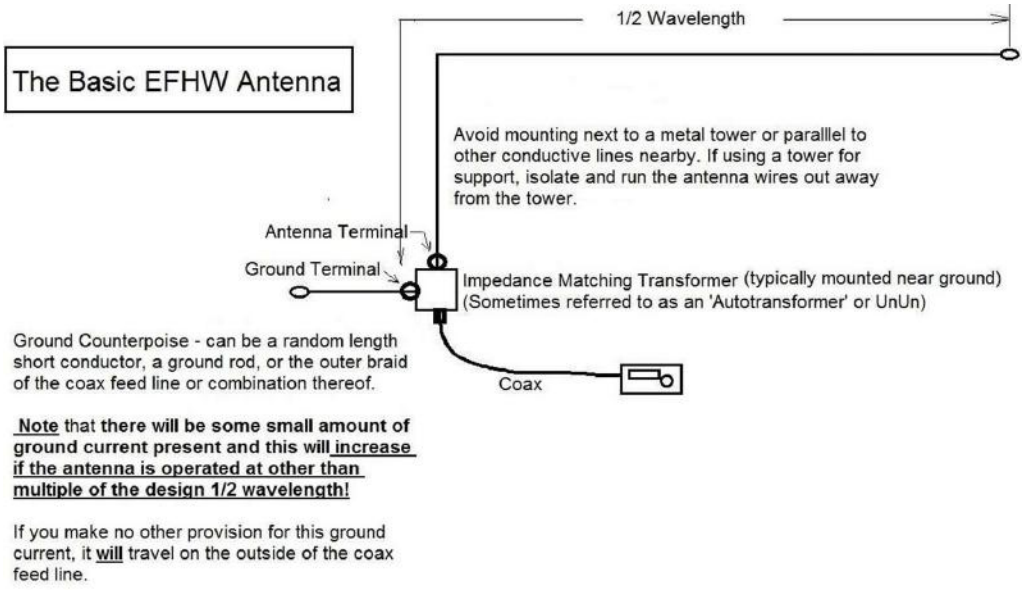
Type 43					
MHz	u'	u"	Gs	Core Eff	Core Pwr
3.6	470.2	224	0.00296	85.20%	
7.1	332	228	0.00255	87.25%	
14.2	201.2	204.3	0.00226	88.70%	6.215
21.2	135.3	179.4	0.00216	89.20%	5.94
28.5	97.5	158.4	0.00207	89.65%	5.6925

Type 52					
MHz	u'	u"	Gs	Core Eff.	Core pwr
3.6	278.7	7.8	0.000359	98.21%	0.98725
7.1	305.2	73.8	0.00136	93.20%	3.74
14.2	186.8	151.2	0.00238	88.10%	6.545
21.2	132.2	126.8	0.0023	88.50%	6.325
28.5	107.2	109.4	0.00211	89.45%	5.8025

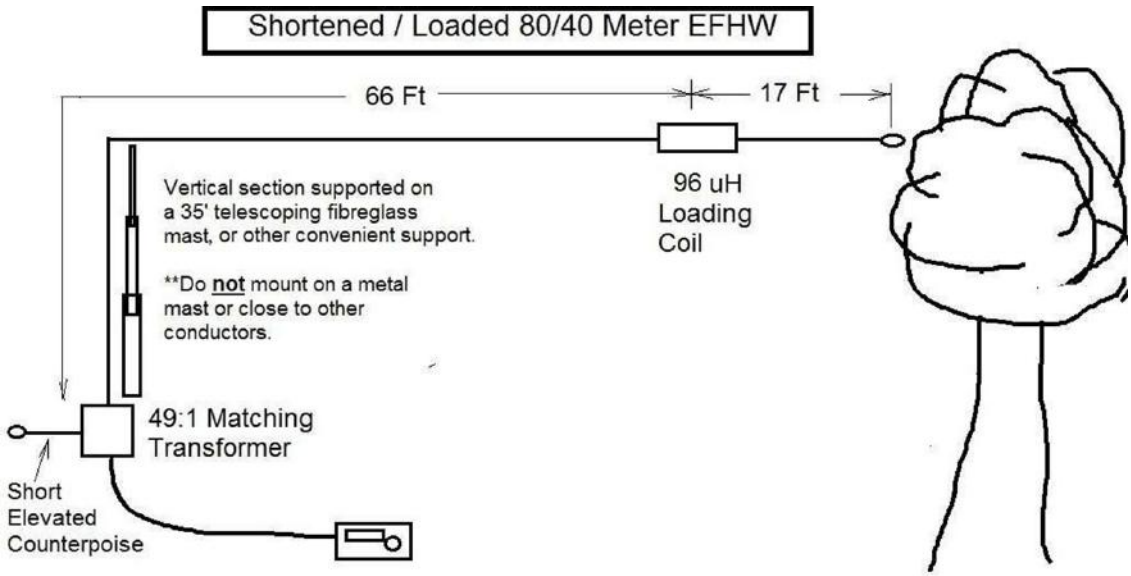
Type 61					
MHz	u'	u"	Gs	Core eff.	Core pwr
3.6	120.6	0.6	0.000148	99.26%	0.407
7.1	123.4	1.2	0.000143	99.29%	0.39325
14.2	136.8	6.2	0.0003	98.50%	0.825
21.2	153.7	41.5	0.000996	95.02%	2.739
28.5	124.5	76.6	0.00162	91.90%	4.455

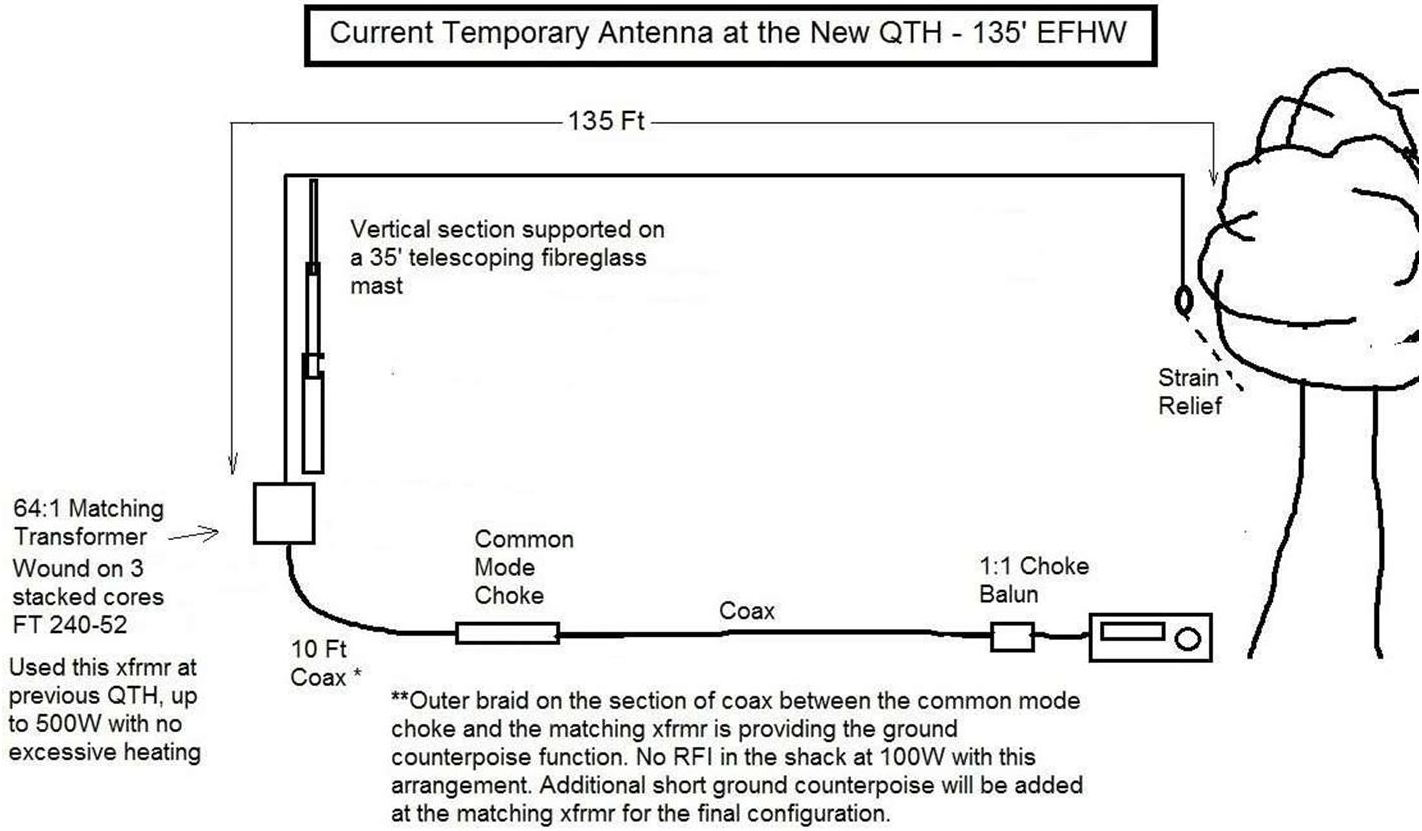
This is the clear winner!

The next few slides show some practical examples of EFHW antennas that I have experimented with over the past few years. My computer drawings are not the greatest but they will get the idea across. These antennas have worked surprisingly well and have gone a long way towards dispelling my initial misgivings about common mode currents on the coax and RFI concerns. I have operated some of these antennas from the townhouse at times running 400 watts into a wire that terminated in the attic of the townhouse with no adverse effects. And the antennas have performed with surprising efficiency. One of the primary benefits being able to feed the antenna near the ground with the high current points still well up on the antenna.



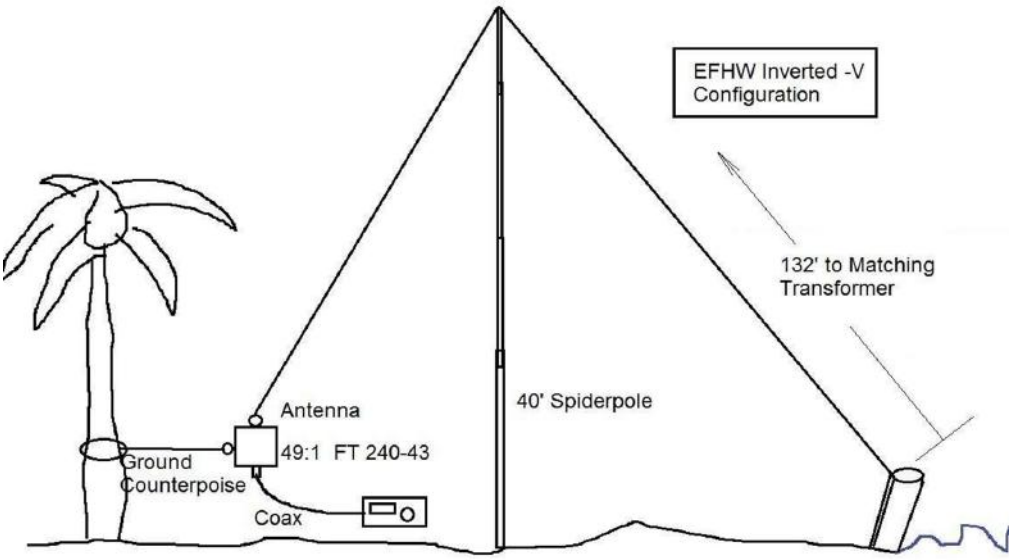
This antenna initially built and tuned as a 40m EFHW, then added a loading coil and short additional wire which was trimmed to resonance on the desired 80m frequency. High inductance of the loading coil effectively isolates the added 60m secton from the original 40m antenna. It worked well on both bands.





This antenna is tuned for resonance just below the 80m band but it is exactly resonant over a good portion of the low end on 40m which was my primary aim. The transformer is wound on **3 stacked** FT240-52 cores to afford high power capability without excessive heating of the cores. The result is an SWR that is slightly high (3:1) at the bottom of the 80m band but less than 2:1 across the entire 40m band, and easily capable of handling 500 watts input with long duty cycles. The antenna is easily useable on the other bands with my antenna tuner and seems to be performing well in spite of its' low height above ground.

This is the configuration used extensively over 3 winters in Florida operating from the shores of Tampa Bay. The antenna was completely portable, and set up several times a week in various locations. I routinely checked into a weekly Olivia net running 50W and usually did well into Chino Valley AZ, Chance Harbor NB, Deep River ON, and Oakton VA. Also worked CW at 80W into Vancouver Is., Curacao, St. Barthelemy, Honduras, Spain and Switzerland, and much of the U.S. The nearby salt water probably helped, but I was very pleased with the operation of this antenna.



The telescoping Spiderpole mast mounted to a home brewed drive on base for portable operation. This photo taken at Fort De Soto park near Tierra erde riht on the inlet to Tampa Bay.

Digital and CW mode operating from Ft De Soto Park, using a battery powered TS-570 at 60 watts to the EFHW antenna supported with the Spiderpole and nearby palm trees (which were not ery high). But a great way to spend a winter day, with breaks from the radio to do some kayaking!

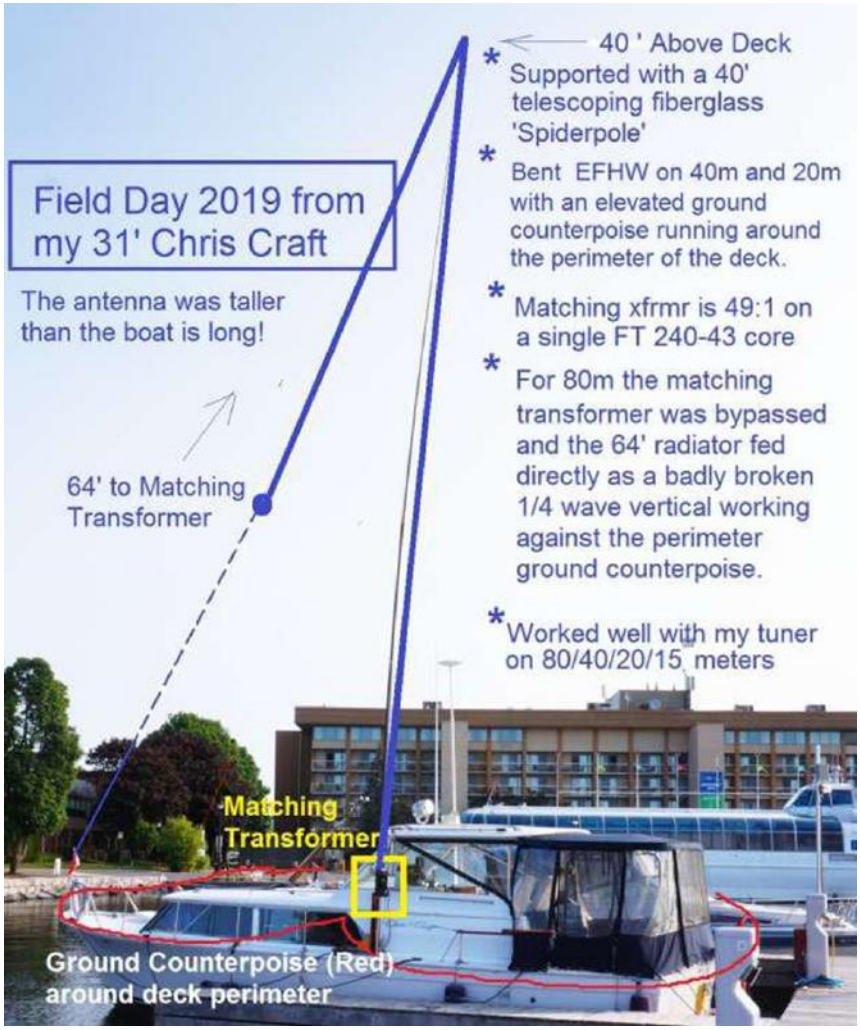
Steve Dick, K1RF has an excellent PDF tutorial on EFHW antennas that is well

.

worth reading for more information on these antennas.

Clicking on this URL should take you to the website…

http://.gnarc.org/wp-content/uploads/The-End-Fed-Half-Wave-Antenna.pdf

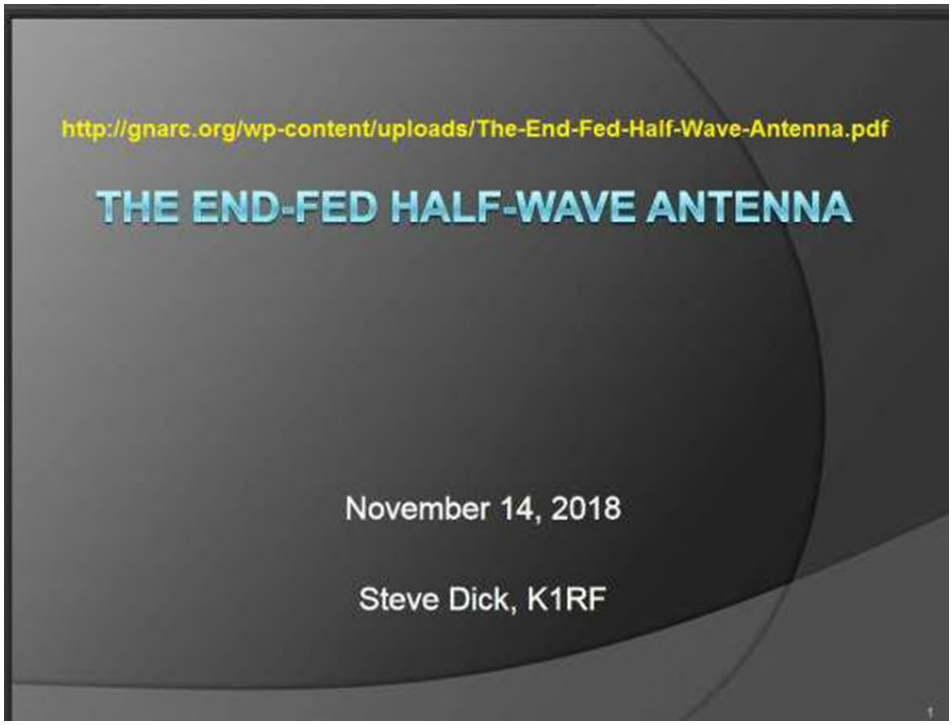


Another variation that I came up with while wintering in Florida, configured so that I could connect a 1/2 wave radiator to the matching transformer, or I could bypass the transformer and feed the radiating element directly and work it as a vertical antenna against a raised ground counterpoise.

I adapted this arrangement to our boat for last year's Field Day event and had a lot of fun working 206 CW contacts. The only time that my wife agreed to letting me set up a ham radio station in the boat. And it ihad to be removed immediately after FD.

I've never been able to convince her that it would be beneficial to have hm radio on our Chris Craft.

I don't understand why my wife would be opposed to leaving this set up in the boat!



Portable operating for the 40m Tuesday night Olivia net from a site at our Florida condo , using the EFHW antenna.

73 de Rick VE3ORY

Securing PowerPole connectors

By Dan Romanchik, KB6NU

In preparation for this year's Field Day, I made a bunch of cables with PowerPole connectors to connect the solar panel, charge controller and batteries that I used. If you're not familiar with PowerPoles, you might want to check out this YouTube video.

https://youtu.be/o31iuOcQ-jo

They're really great connectors, and have become the DC connector of choice for many hams.

When I make up PowerPole cables, I normally don't bother trying to secure the two halves together, especially if you're using some decently heavy gauge wire. They fit together pretty tightly, and don't come apart easily. Even so, I think securing them together is a good idea. You can buy a little roll pin to insert between the red and black housings that is supposed to prevent them from coming apart, but many folks complain that the pin has a tendency to fall out. This not only defeats the purpose, but could also damage your equipment.

Securing them is the right thing to do, though, and I recently came across some great suggestions on how to do this in the daily digest that I receive from the Elecraft-KX mailing list. Here are the best tips from the thread, Securing Anderson Power Poles:

- Rudy K8SWD: You can thermally bond the red and black housings with a soldering iron like you are making little welds on both sides. Permanent (mostly) but it works better than the roll pins. Just clean the tip really good before soldering!
- Dave K0CDA: [Anderson] also make connectors that are thermally bonded together in pairs. They do NOT come apart.
- Don W3FPR: I use a drop of Super Glue on the junction of the plastic pieces. Warning – that glue grabs quickly, so slide the 2 pieces onlyl enough to start the assembly, then apply the drop of glue and quickly finish sliding them together. I have never had ones prepared like that come apart, and I don't use roll pins. I will say one more thing – use only the genuine APPs. I have seen some knockoffs that do not mate well.
- Greg KC9NRO: Take a hot soldering iron. Wipe the tip with sponge. Run the tip down both side of APP bonding the black and red sides together. Clean soldering iron tip and apply some solder to tip. That's how I roll. Never comes apart
- Mike AI4NS: PVC cement will soften the plastic enough to bond them together. You can also get plastic welding rods, such as Daindy Plastic Welding Rods. Chuck a rod in a Dremel and weld them together. I have made plastic boxes and panels using this method.
- Jack WD4E: Snip the cotton end off a Q-tip, cutting at an angle. Insert into hole made for roll pin, cut off excess, save remainder of Q-tip for next requirement.
- Troy K4JDA: 2.5mm screws work well, stay in, and are easily removable.

I posted these suggestions to my blog and got a few more great suggestions:

- Tom KB8UUZ: Fat tooth picks also work great. Jam it in, break it off.

- Bruce N0NHP: I use MEK (Methyl Ethyl Ketone) replacement to clean my circuit boards after soldering. A single drop of MEK on the junction between the two halves of the PowerPole shell will fuse them. It can be broken with a sharp tap but not accidentally. It will set and dry in seconds and should be applied after the shell pieces are put together.

I think these are all great suggestions. I think that I'm going to try the cotton swab method. While reading them, another thought occurred to me. I haven't tried this yet, but I'm thinking a little drop of hot glue on the roll-pin hole might work, too.

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Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (KB6NU.Com/study-guides/), and often appears on the ICQPodcast (icqpodcast.com). When he's not thinking up new ways to keep his Power-Poles together, he likes to teach ham radio classes and operate CW on the HF bands.

VE3ERC Elmira Radio Club Inc.

Minutes from June 24, 2020

1. Call to Order & Welcome

The virtual meeting was open at 7:30 pm by our club president Brian VA3DXK

2. Roll Call: Ted VE3TRQ, Bill VA3QB,Brian VA3DXK, Brian VE3YBM, BruceVE3QB, , Kirk VA3KSX, Ken VE3KCY, Roger VE3RKS, Tony VE3DWI, Paul VA3PDC, Tom VE3DXQ, VE3DCC Rich, Wes VE3ML, Bob VE3IXX, VE3BYP Graham, Jack VA3WPJ, Tom VA3VRA, Jim VE3JLC, Brian VE3YBM.

3. Adopt Agenda : Brian VA3DXK - Agenda was adopted.

4. Presentations/Speakers/Workshop: (after the business portion of the meeting.) Demo of FD software by Bill VA3QB. Setting up and using JS8Call by Ted VE3TRQ.

5. Secretary's Report: Tom VE3DXQ asked if there were any errors or omissions to the May 2020 minutes. None were mentioned. Tom asked for minutes to be accepted. Seconded by Paul VA3PDC. Carried.

6. Treasurer's Report: Paul VA3PDC posted the April Financial Statement on screen for us. Some dues came in and payment was made for the RAC insurance. Some small bank fees were also shown. Paul VA3PDC made a motion to have the treasurer's report accepted, seconded by Bruce VE3QB. Carried.

7. President's Report: Brian VA3DXK –Nothing new to report..

8. Committee Reports: Safety Officer-Tom VE3DXQ said he still has traffic cones, safety vests, and safety goggles in his Garage and will take them to his new location.

Field Day- Brian VE3DXK per the rules AARL has put out for people able to work the bands from their homes we can collect points as a club as well as individually. There was also discussion about how we might run field day next year providing things go back to normal.

Point Clark Light House-Brian VE3DXK- The point Clark lighthouse weekend will occur on August 22-23, 2020. This is a week later then usual because of Victory in the Pacific Day. Brian said ILLW will be going on around the world depending on covid-19 restrictions in various places. Brian said he checked with parks Canada to see if Point Clark Park is open yet and at this point it is not. Brian said he has the event registered and a contact there. Bill VA3QB said that we will likely be just the Saturday, and will probably not go ahead if washrooms are not open. Brain said he will keep an eye on the situation with the washrooms.

9. Unfinished Business: None

10. New Business: Tom VE3DXQ said he thought it would be useful if we could have a digital repository so that when he hands off files to the New Secretary Kirk VA3KSX. Bill VA3QB said that within Groups.io there is a file are that can be used for this purpose. This is a closed system for members only, so this should be fine.

Hats & T shirts-Paul VA3PDC said he enough requests. Paul put a motion on the floor for a dozen hats a $15.00 each and free to new members. Seconded by Kirk . Bill VA3QB asked if you could have your name or call sign on the hat. Paul said that he will send out a form you can fill out to select what you would like on your hat. You can pay by check made out to the club and sent to Paul's home address. email transfer is also available. Colors are yellow or black. Motion was carried.

Wednesday 10:00am Coffee (Bill VA3QB) Arena parking lot beside the EDSS Sports Field Track.

1**1.ANNOUNCEMENTS**: ● Field Day June 27-28 ● RAC Canada Day Contest 0000 UTC to 2359 UTC July 1, 2020 ● Point Clark Lighthouse Aug 22-23 – pending Parks Canada decision ● Next meeting: Wednesday September 23rd, 2020.

Roger VE3RKS made a suggestion we have a virtual meeting on the 4th Wednesday of the month just to have a social, no official business. Everyone was agreeable to this although no motion on it.

12. Presentations: Bill VA3QB was up first with a presentation of the Field Day Software. Bill set up his computer so we could see his screen. He opened up the software and showed how you could expand the display or shrink it. He showed us some sample calls, and how there is a map showing where your contacts were made. This software also can follow the frequency on your radio. He said you can set to show the last 20 calls or all. You can also select a call to edit it. He thanked Bruce VE3QB for letting us use the software which he purchased.

Ted VE3TRQ was up next: Ted said that JS8 call is very similar to FT8. The big difference is you can actually insert text and have conversation. So it is a digital mode. Ted shared his screen to show us an active session. The program keeps a record of your calls. There are group calls or individual calls. You can set up a private net as well. There are 3 speeds for JS8 slow, normal, and turbo. This is a great way to rag chew when regular bands are lousy. Ted said he will use it on field day and it can have macros in it.

13. Adjournment: Tom VE3DXQ made a motion to adjourn. Motion Carried.

Correspondence

Attention all CW Operators:

Effective July 1, 2020, Radio Relay International will be implementing a series of weekly training broadcasts designed to prepare CW operators for participation in traffic nets. Training broadcasts consisting of radiogram training messages will be transmitted on 20, 40 and 80 meters each Wednesday/Thursday. An outline of the program and the operating schedule may be found here:

http://radio-relay.org/wp-content/uploads/2020/06/RRI-Weekly-Broadcast-Schedule-FA-2020-7-1.pdf

73,
Radio Relay International