

## End Fed Half Wave Antennas – EFHW ANTENNAS

Steve Ellington N4LQ started up a group on Facebook called End Fed Half Wave Antennas. The purpose of this group is to explore the use of an end fed half wave antenna. An end fed half wave antenna is one of a specific length depending on the frequency that it is to be used on, for example, an end fed half wave antenna for 80 meters is about 130' long. The length of a half wave antenna is calculated using the following formula:  $L \text{ (ft)} = 468 / f \text{ (freq in mhz)}$ . The end fed half wave antenna presents a large impedance to your rig, so this impedance must be stepped down to a more useful impedance that is closer to 50 ohms. Most radios today expect to see an antenna with an impedance of 50 ohms at the end of it.

End-fed Half Wave antennas (or EFHWs) cover multiple bands without traps, stubs, or resonators. End-fed wires resonate on their 1/2-wave fundamental frequency plus ***all odd and even harmonics above***. By adding a broad-band matching network, the wire's high impedance feed point is transformed down to 50 ohms across a wide frequency range and, in most cases, you don't need a tuner to operate. Note that a single-wire radiator may be installed using only one high center or end support, making it fast and easy to set up at home, on the road, or as a "grab-and-go" emergency antenna.

There are many different ways to transform this impedance to 50 ohms. The one that Steve promotes is to use a 49:1 unun and information about this method follows.

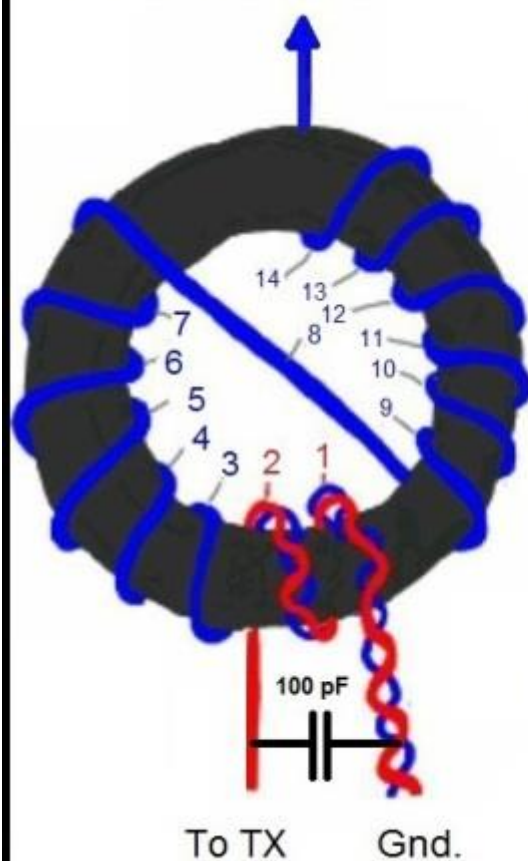
The following is a diagram which explains how to construct a 49:1 transformer.

# 49:1 Transformer

Primary 2 Turns.

Secondary 14 turns (Total turns)

To End Fed Half Wave Antenna.



## Parts List

### Toroid Core:

Mouser Part #623-5943003801  
240-43 Toroid 12.7mm x 61mm

*\*Use 1, 2 or 3 cores depending on transmitter output to be used.*

### Capacitor:

Mouser Part #81-DHR4E4C221K2BB  
100 - 110 pF. You can use TWO  
220 pF @ 15 kV in series.

### Antenna:

80m - 10m use a 134' wire.  
40m - 10m use a 67' wire, etc.

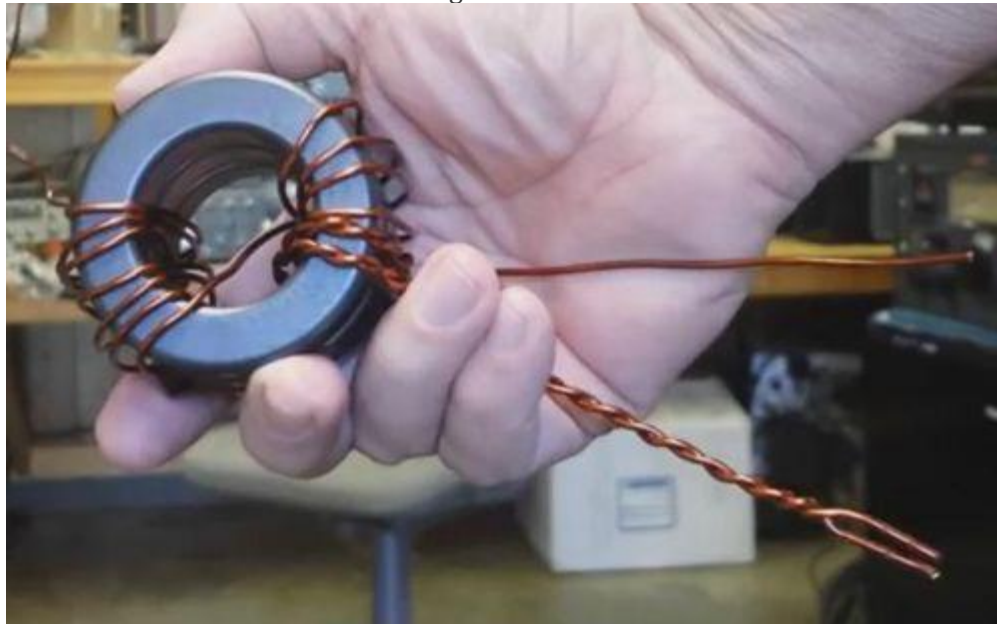
### Wire:

14 gauge enameled wire.\*\*

*\*\* When using 3 toroid cores start with a Primary wire of ~13" and Secondary of ~80" long. 1 & 2 cores will use less wire.*

Revised: 07/14/2017 - K1TA

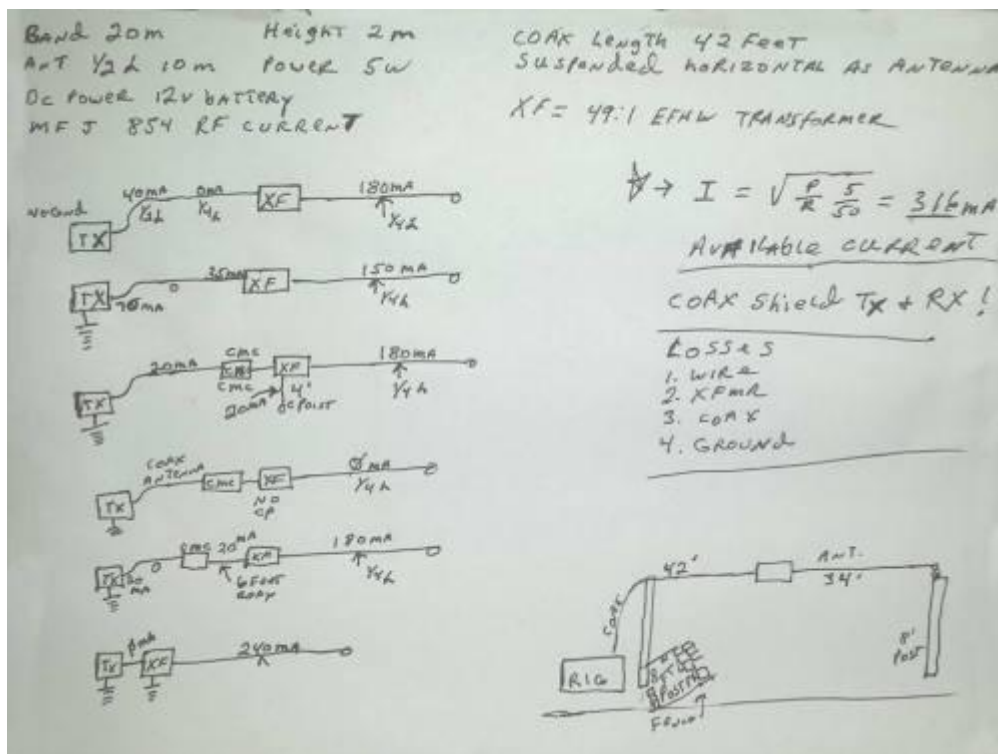
Wound with #14 enameled wire using FT240-43 toroids:

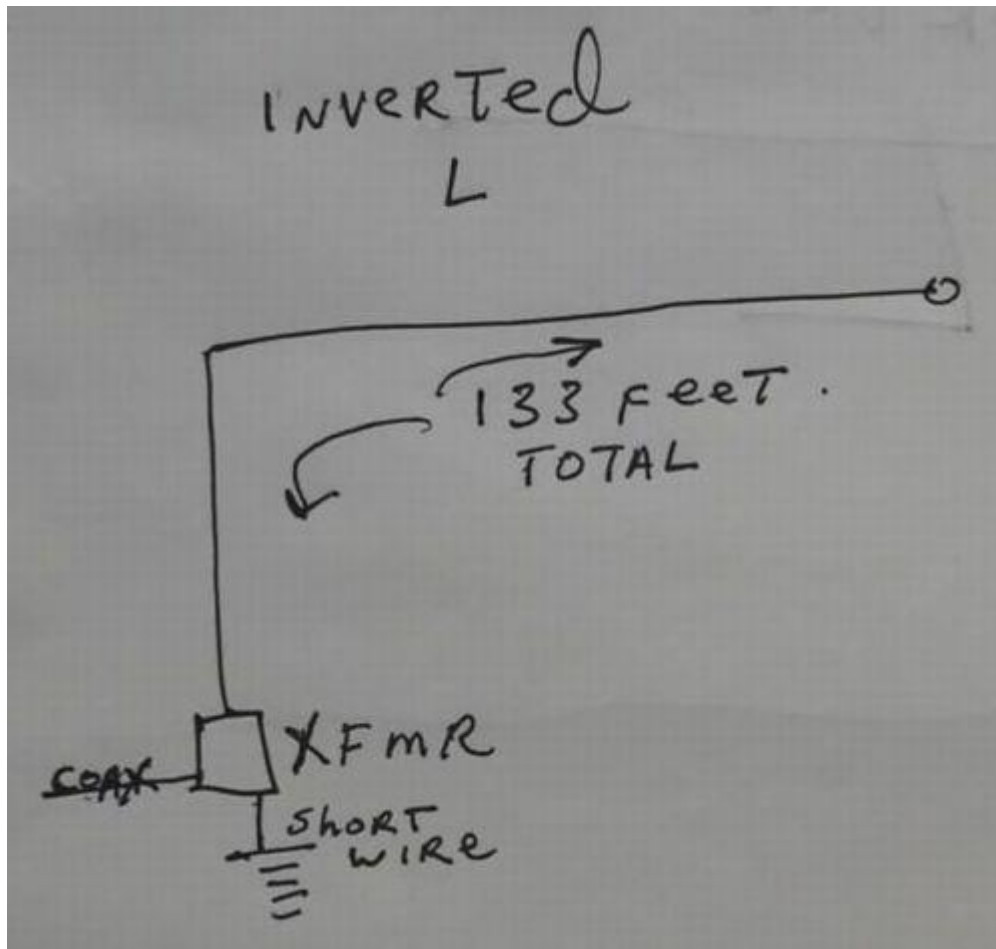


Steve made a video in which he showed the results of antenna tests using various setups.

Video: [EFHW Installation Summary or Is your feed line part of the antenna?](#)

Steve's best test results were with the transformer grounded close to the ground and fed with enough coax to reach the transmitter also grounded. Details are shown in the next two images:





Steve Ellington's antenna:

133 ft. inverted L with 51 feet vertical. Transformer grounded, very well. Coax on ground 100+ feet to shack, no chokes. Home brew transformer 2 primary 13 sec. mix 52 three stacked cores. 14 ga wire .. swr acceptable ...below 2.5 and much lower

Modification for 75 meters:

Here is how to raise the resonant frequency on your myAntennas EFHW-8010 for 75 meter phone operation without affecting the other bands. Simply cut the antenna at the half way point and insert a capacitor. 500pf will put you at around 3700khz. Lower values i.e. 300pf will raise it even higher. I suggest a ceramic disc capacitor rated for at least several KV just to be safe. I have tested and verified this and it works great.

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**VIDEOS BY STEVE ELLINGTON N4LQ RELATED TO EFHW ANTENNAS:**

- July 26, 2017 [EFHW Installation Summary or Is your feed line part of the antenna?](#)
  - Apr 1, 2017 [DIY 49:1 Transformer for EFHW Using Stranded House Wire \\*\\*](#)
  - Apr 1, 2017 [Winding a transformer for End Fed Half Wave Antenna — EFHW \\*\\*](#)
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## MYANTENNAS EFHW-8010-1K



## 49:1 TRANSFORMER VENDORS

- [myantennas](#)
- [hyendcompany](#)
- [balundesigns](#)
- [MFJ MFJ-1982/MFJ-1984](#)
- [packtenna \(QRP only\)](#)
- [communicationworld](#)