Complete End-Fed Antenna Installation

Full System Diagrams: Wire, Counterpoise, Grounding

Introduction

- End-fed antennas are simple and versatile
- Require careful grounding and counterpoise design
- Common in HF amateur radio setups

What is an End-Fed Antenna?

- A single-wire antenna fed at one end
- Uses impedance transformer (Balun)
- Works on multiple bands depending on length

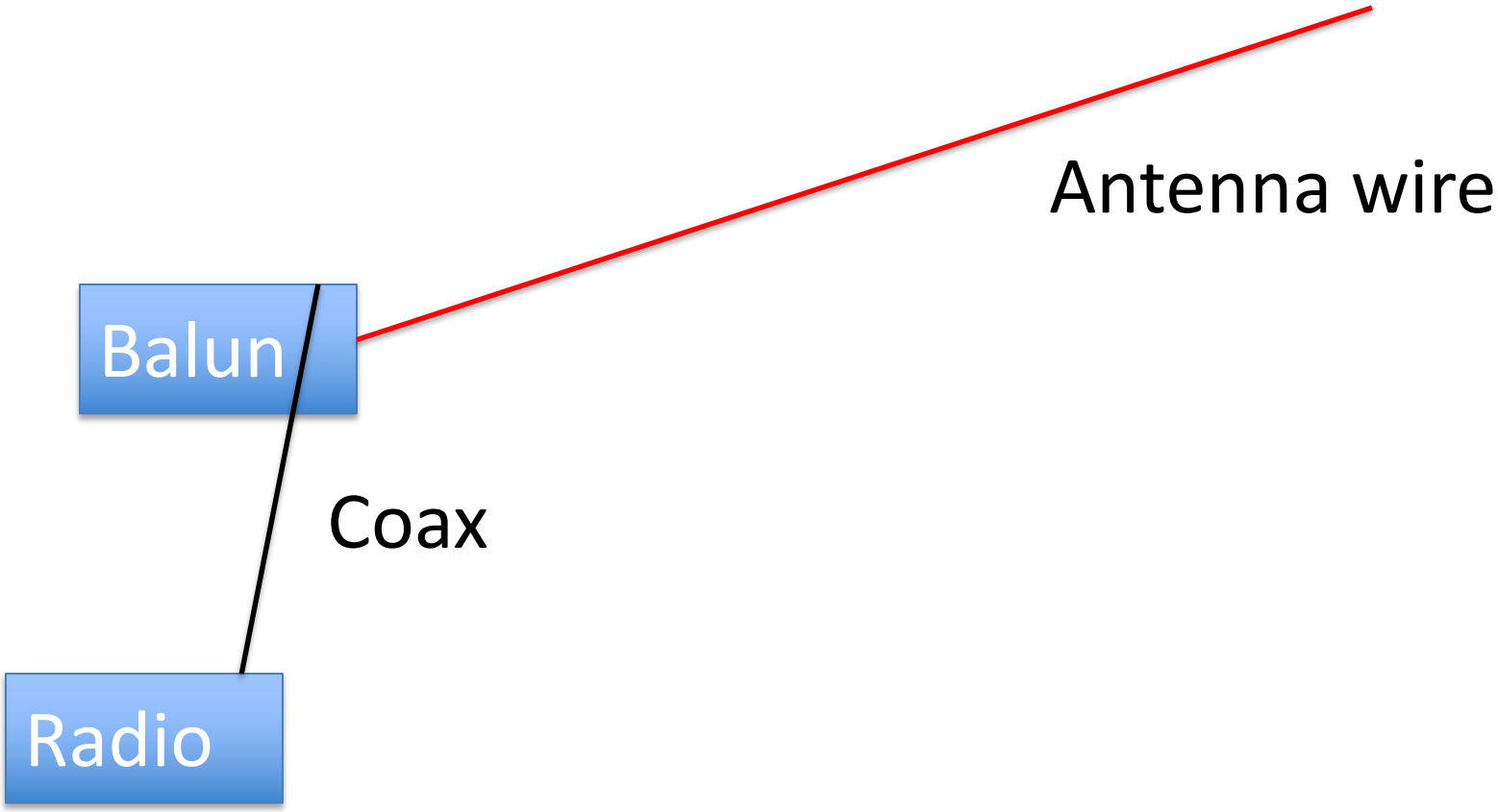
Basic Components

- Radiating wire
- Balun (matching transformer)
- Feedline (coax)
- Ground or counterpoise system

Installation Setup

- Mount transformer near ground level
- Raise wire to tree, mast, or support
- Slope or horizontal installation possible

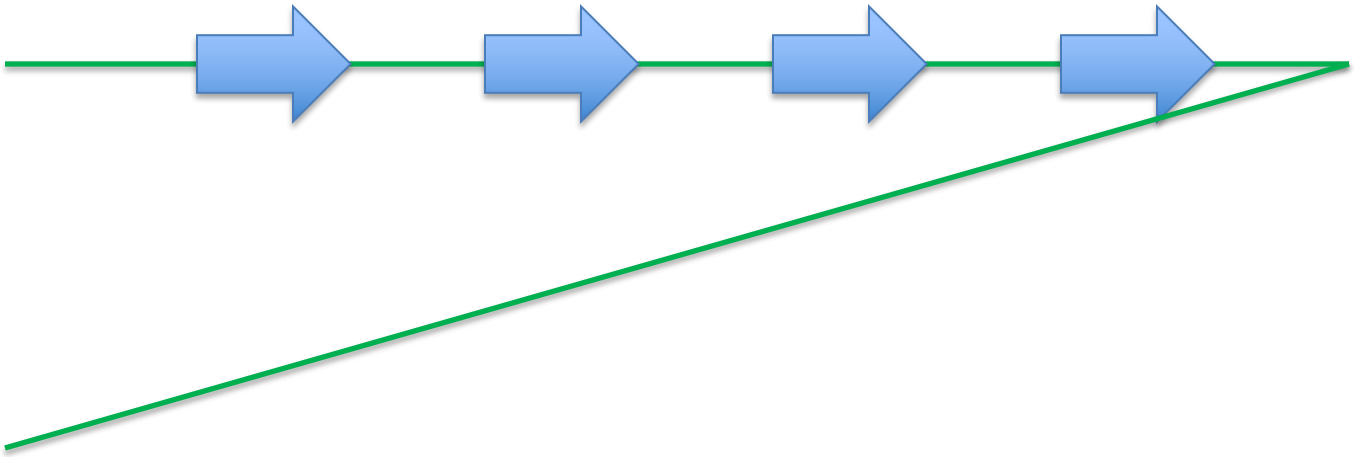
Basic End-Fed Antenna Layout



Counterpoise Explained

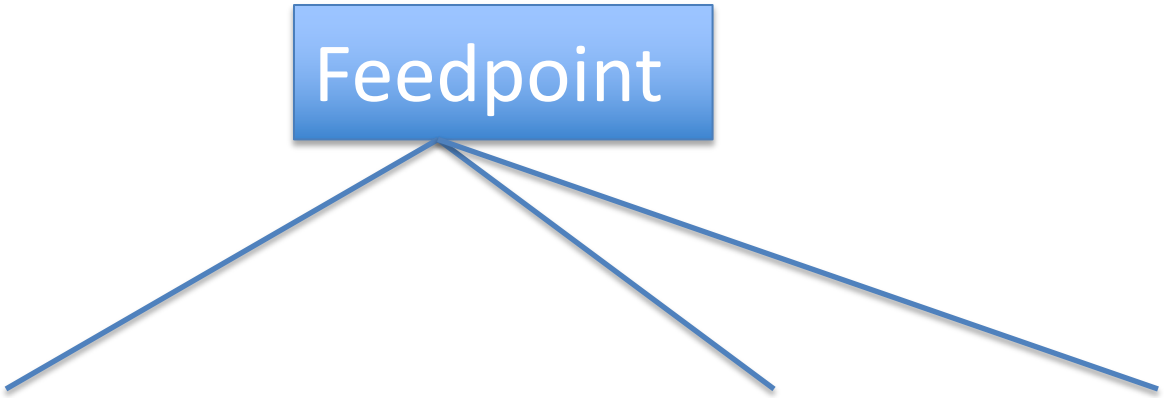
- Provides return path for RF current
- Improves efficiency and tuning
- Can be wire(s) laid on ground or buried

RF Current Flow Concept



Return via counterpoise/ground

Counterpoise Example



On top of ground or buried underground

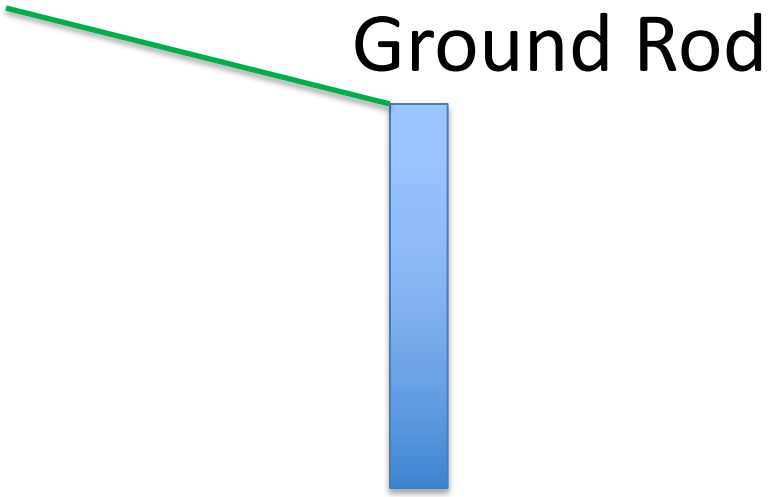
Counterpoise Options

- Single wire counterpoise
- Multiple radial wires
- Using coax shield as counterpoise (bad idea)

Grounding Importance

- Helps with safety and lightning protection
- Stabilizes RF system
- Reduces noise and interference

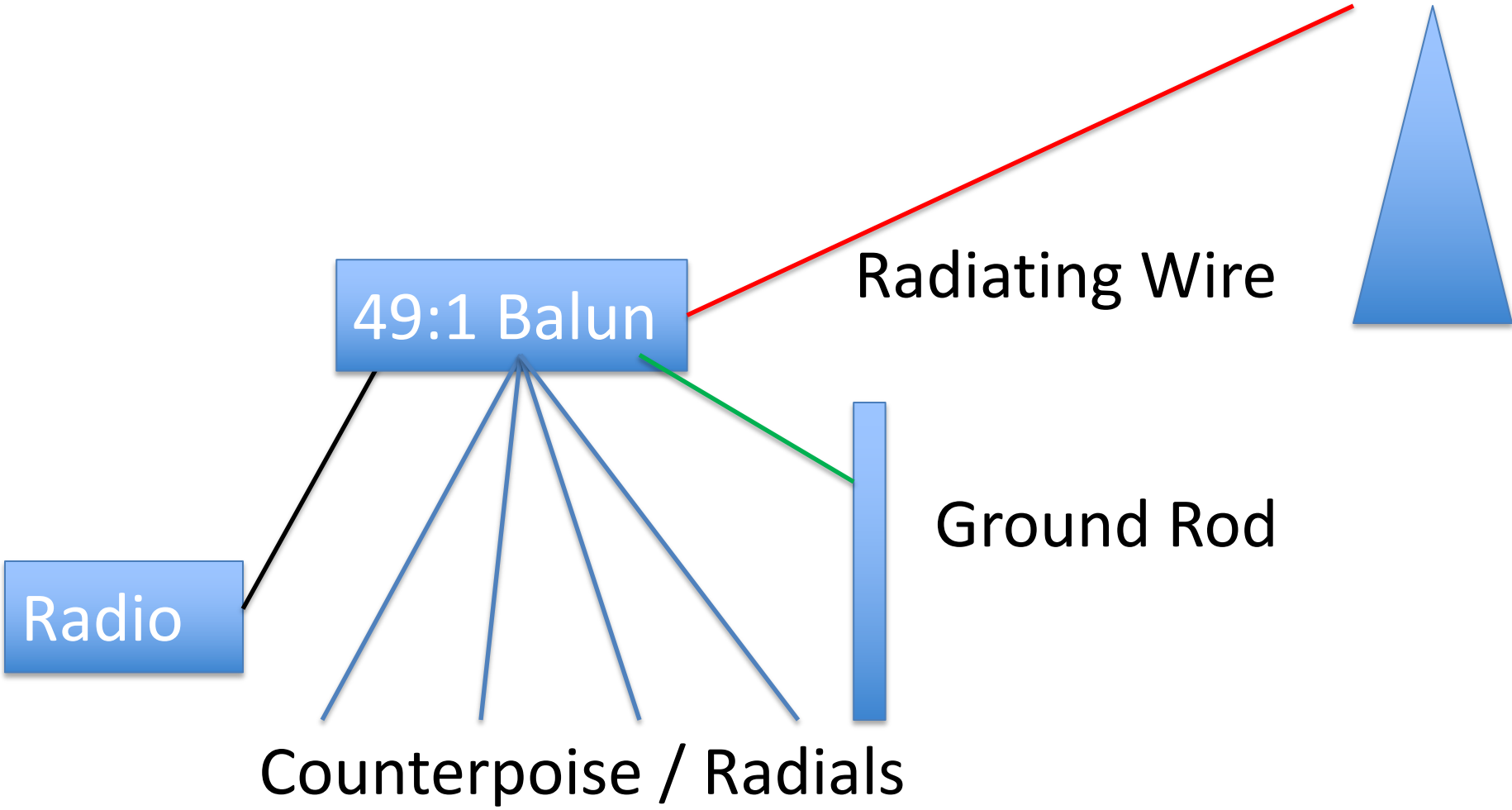
Grounding System



Grounding Methods

- Ground rod driven into soil
- Bonding station equipment
- Using radial ground system

Full End-Fed Installation Overview



Basic Diagram Description

- End-fed wire from balun to support
- Counterpoise connected at feedpoint
- Ground rod near transformer
- Coax runs to radio

Safety Considerations

- Keep antenna away from power lines
- Use proper grounding for lightning
- Disconnect during storms

Summary

- End-fed antennas are easy to deploy
- Counterpoise is essential for performance
- Proper grounding improves safety and efficiency

Logistics

- Antenna wire (polys-13):

  Davis RF
  P.O. Box 370
  N. Haverhill, NH 03774
  Phone: 603-787-2200

- Balun (model 49131) (49:1, 80-10m, 1kw):

  Balun Designs
  10500 Belvedere
  Denton, TX 76207

- Ground rod and wire:

  Available at local Home Depot or Lowe's

Antenna Length Chart

SWR										
Lenght (m)	1.8 MHz	3.5 MHz	7.0 MHz	10 MHz	14 MHz	18 MHz	21 MHz	24 MHz	28 MHz	50 MHz
54	5.2	1.6	1.1	1.1	1.8	1.3	1.6	1.7	1.2	1.5
53	4.65	1.2	1.2	1.2	2.1	1.4	1.4	1.5	1.2	1.1
50	3.5	1.1-1.7	1.3	1.6-1.7	1.6-1.9	1.8-1.9	1.1-1.5	1.5	1.1-1.7	1.1-1.5
45	3.2	2.2-2.6	2.4	2.4	1.4-1.6	1.3-1.4	1.1-1.2	1.4-1.5	1.1-1.6	1.0-1.6
41.5	3.4	2.7-3.5	2.6	1.6-1.7	2.0-2.1	2	1.6-1.7	1.5	1.5-1.7	1.1-1.4
35	3.3	3.8-3.9	1.2-1.4	1.6-1.7	1.6	1.8	1.6-1.7	1.4	1.1-1.7	1.4-1.5
30	2.8	3.0-3.5	1.6-1.8	2.3	1.8-2.0	1.3-1.4	1.1-1.3	1.7	1.1-1.7	1.1-1.7
27	2.8	2.5-2.8	2.1-2.3	1.8-2.0	1.2-1.4	1.9	1.7-1.8	1.4	1.5-1.7	1.2-1.6
22	2.2	1.7-2.0	2.8-2.9	1.2	1.8-2.0	1.4	1.4-1.6	1.1	1.5-1.7	1.0-1.4
18	1.6	1.6	2.0-2.1	2	1.4-1.6	2	1.0-1.1	1.6-1.7	1.2-1.4	1.4-1.6
16.2	1.6	1.4	1.4-1.6	1.5-1.6	1.1-1.2	1.9	1.2-1.3	1.1	1.7-1.8	1.0-1.2
15	1.5	1.2-1.4	1.3-1.4	2.4	1.2-1.3	1.6	1.6-1.7	1.4	1.4-1.8	1.5-1.6
13.5	3	1.1-1.3	1.1	2.1	1.7-1.8	1.3	1.7-1.8	1.6	1.1-1.3	1.2
11	2.2	1.0-1.3	1.2	1.3	2.0-2.1	1.6	1.2	1.7	1.6	1.5-1.6
9	3	1.1-1.5	1.6-1.7	1.2	2.1	2	1.3-1.4	1.2	1.6-1.8	1.3-1.5
7.5	3.2	1.6-1.8	2.2-2.3	1.6	1.4	2.1	1.8	1.2-1.3	1.2-1.3	1.4-1.5
6.5	3.5	1.5-2.0	2.0-3-0	1.7	1.1	1.8	2	1.6	1.4-1.5	1.3