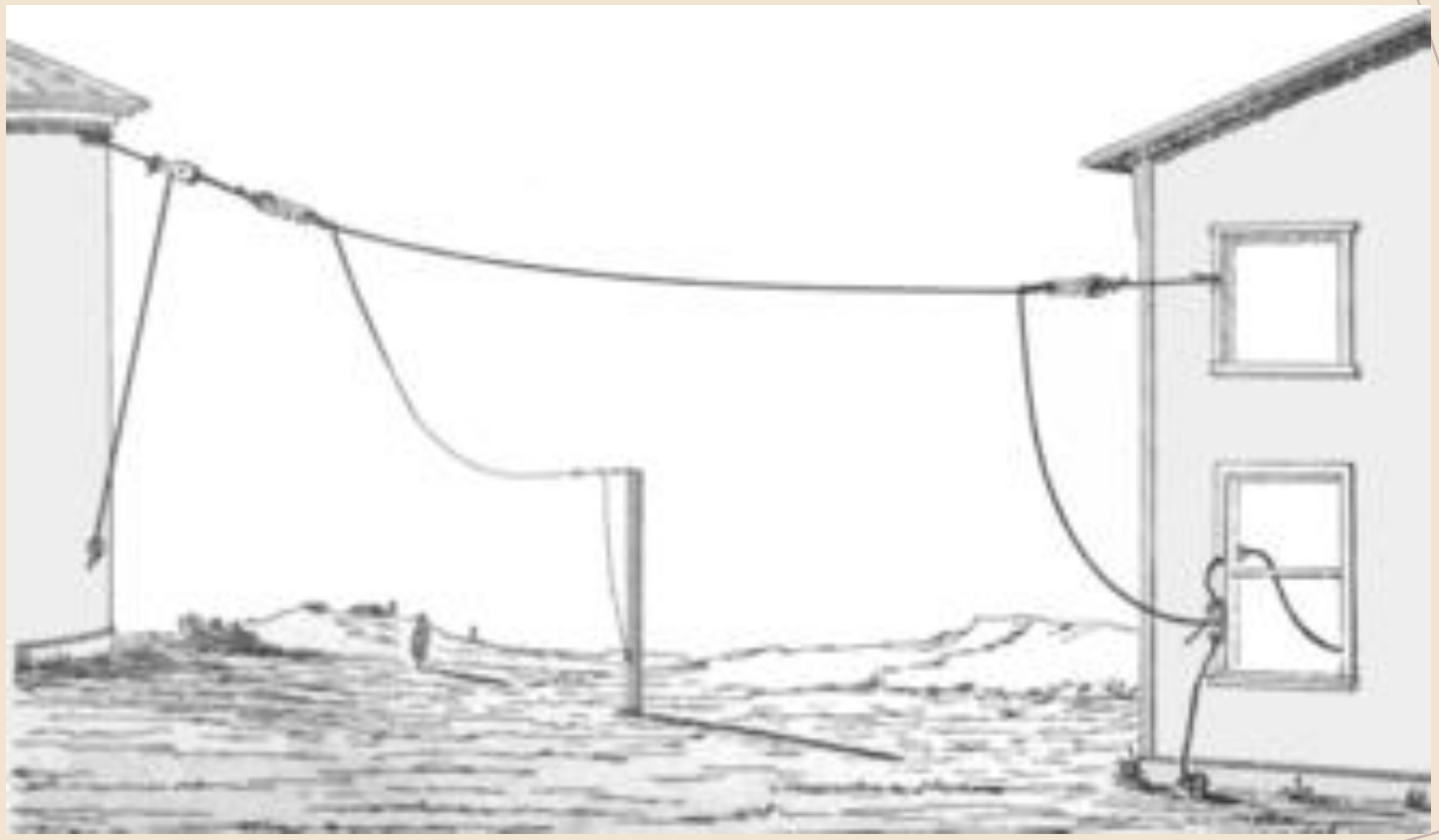
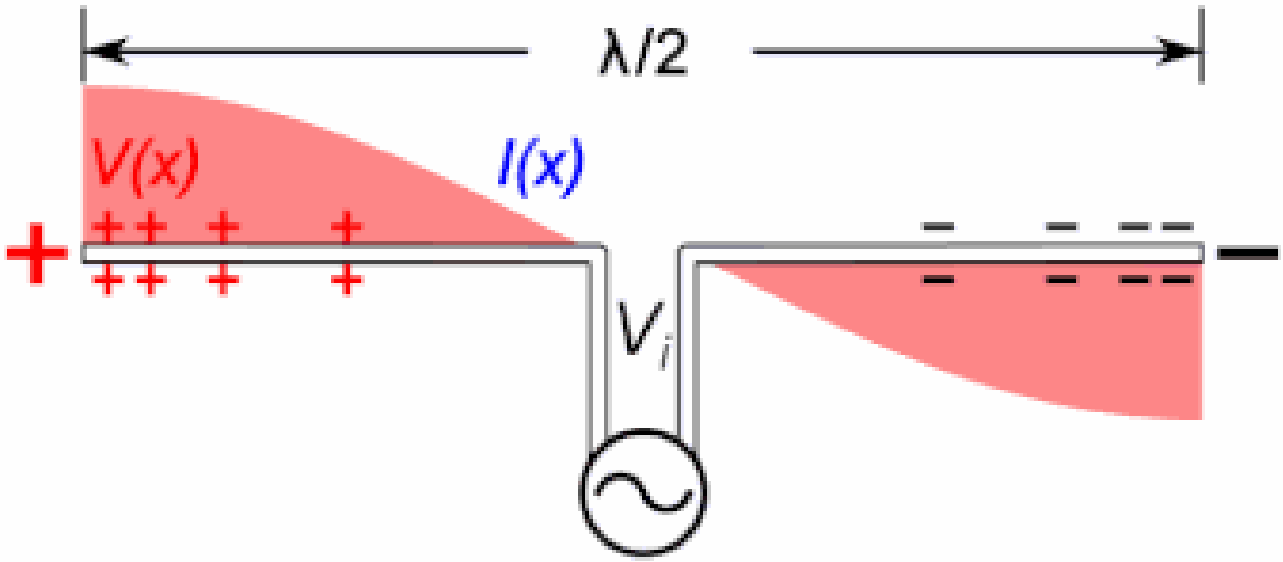
SIMPLE HF WIRE ANTENNAS



Paul Reedy
Ka5pmv

DIPOLE



Advantages of Dipole Antennas:
Simplicity: Just need coax or ladder line and wire

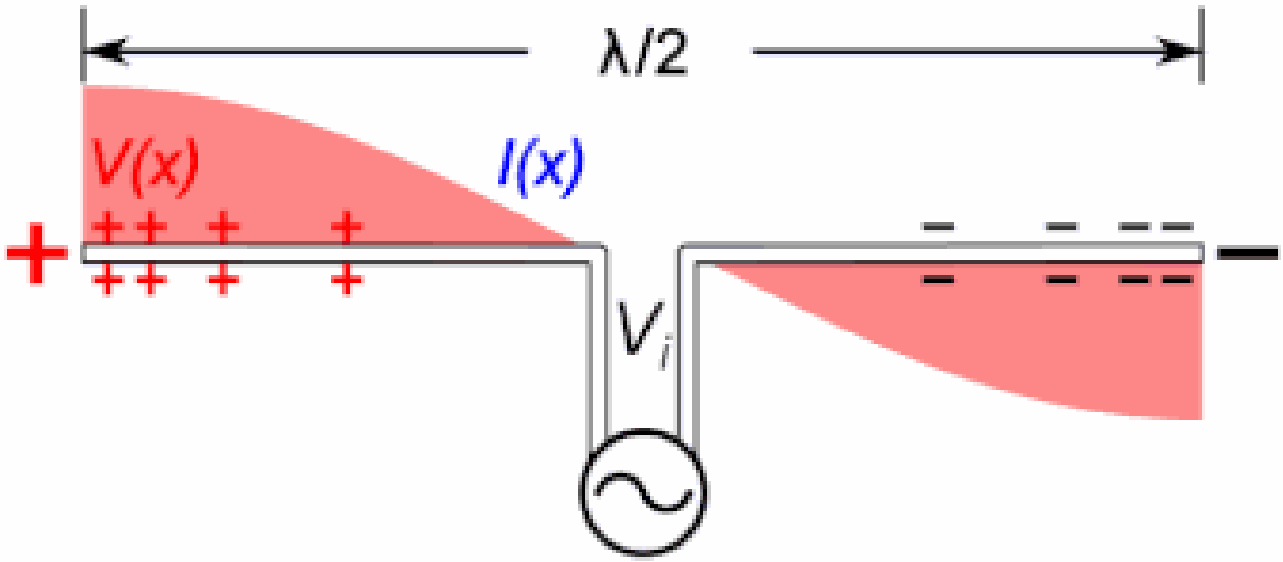
Versatility: They can operate on several different HF (high-frequency) bands, which makes them versatile for various applications.

Balanced Mode of Operation: Dipole antennas provide a balanced mode of operation, ensuring efficient transmission and reception.

Uniform Radiation Pattern: Their radiation pattern is relatively uniform, making them effective in a variety of scenarios.

Easy Impedance Matching: Dipole antennas can be easily matched with standard 50-ohm or 75-ohm coaxial cables, minimizing power loss.

DIPOLE



Disadvantages of Dipole Antennas:

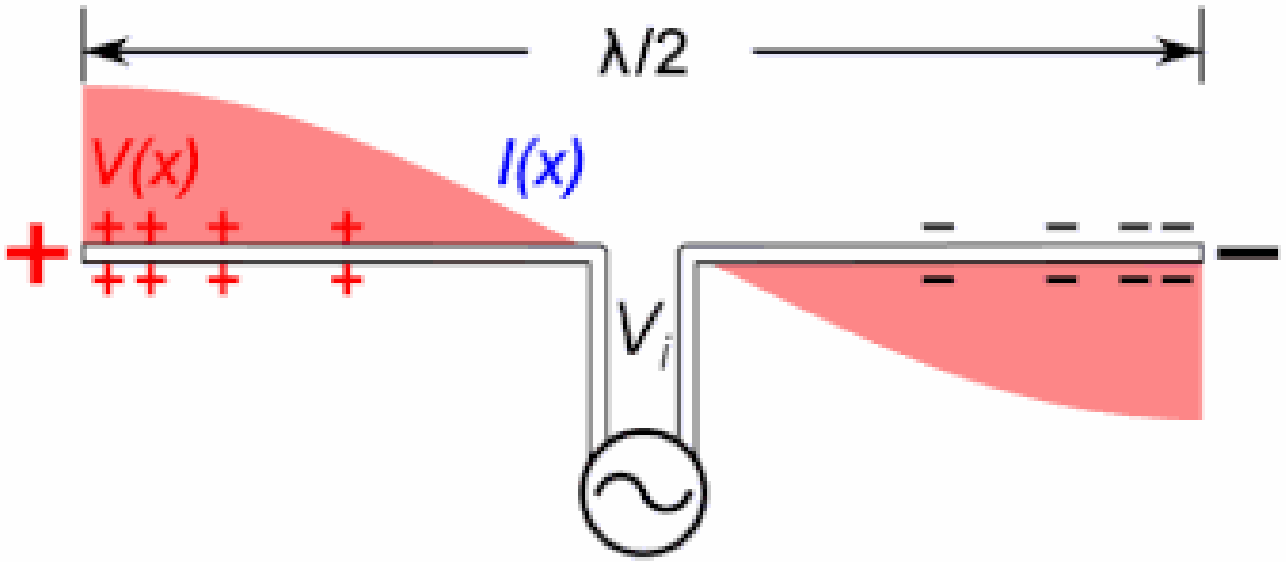
Size: The major drawback of dipole antennas is their size, especially at lower frequencies. As the frequency decreases, the wavelength increases, resulting in longer antennas. This can make them impractical for portable or space-constrained applications.

Bandwidth Limitations: Dipole antennas have limited bandwidth, which may restrict their use in certain frequency ranges.

Height and Orientation: To achieve optimal performance, dipole antennas require proper height and orientation.

Susceptibility to Interference: Nearby objects can interfere with dipole antennas, affecting their efficiency

DIPOLE



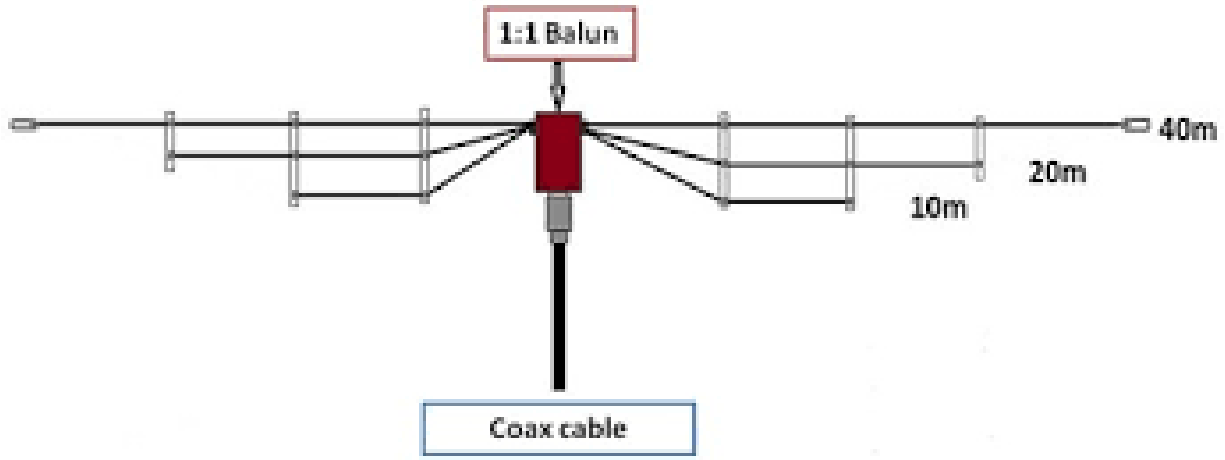
Harmonic Resonances:

- Harmonic resonances occur at odd multiples of the fundamental-resonant frequencies.

- If a dipole is resonant at a certain frequency, it will also be resonant at **3 times**, **5 times**, **7 times**, and so forth of that frequency.

For example, a dipole cut for 7Mhz should also be resonant on 21Mhz

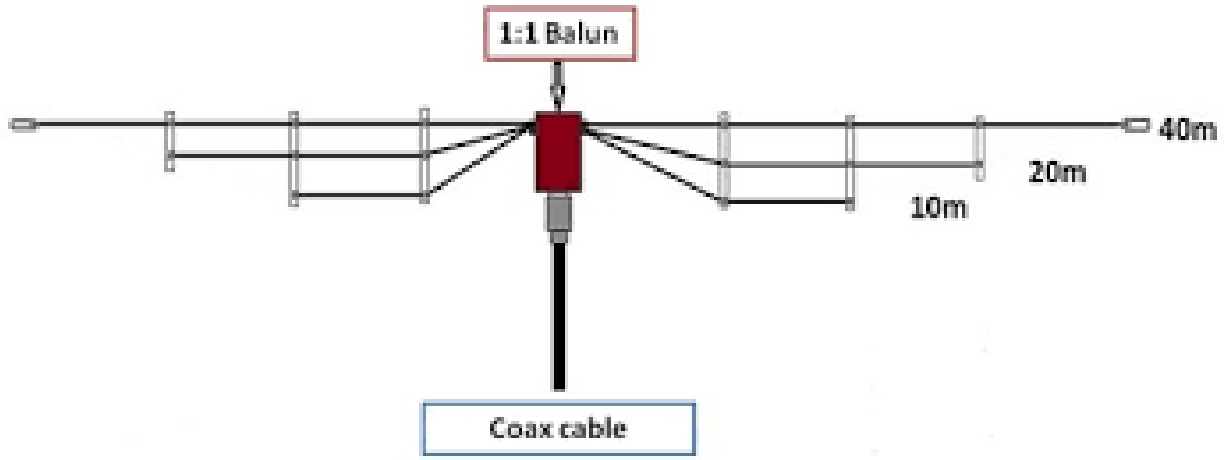
FAN DIPOLE



Advantages of Fan Dipole Antennas:

- **Multiband Capability**: Fan dipole antennas allow you to operate on multiple HF bands using a single antenna. Each dipole element resonates at a specific frequency, providing coverage across different bands.
- **Inexpensive**: Like regular dipoles, fan dipoles are cost-effective and can be built using simple materials such as wire, insulators, and rope.
- **Easy Construction**: You can create a fan dipole by building several individual dipoles and connecting them at a single point. No complex traps or additional components are needed.
- **Omnidirectional Radiation**: Fan dipoles maintain an omnidirectional radiation pattern, making them suitable for general communication.
- **Space Efficiency**: Fan dipoles allow you to enjoy multiband performance without requiring excessive space.

FAN DIPOLE



Disadvantages of Fan Dipole Antennas:

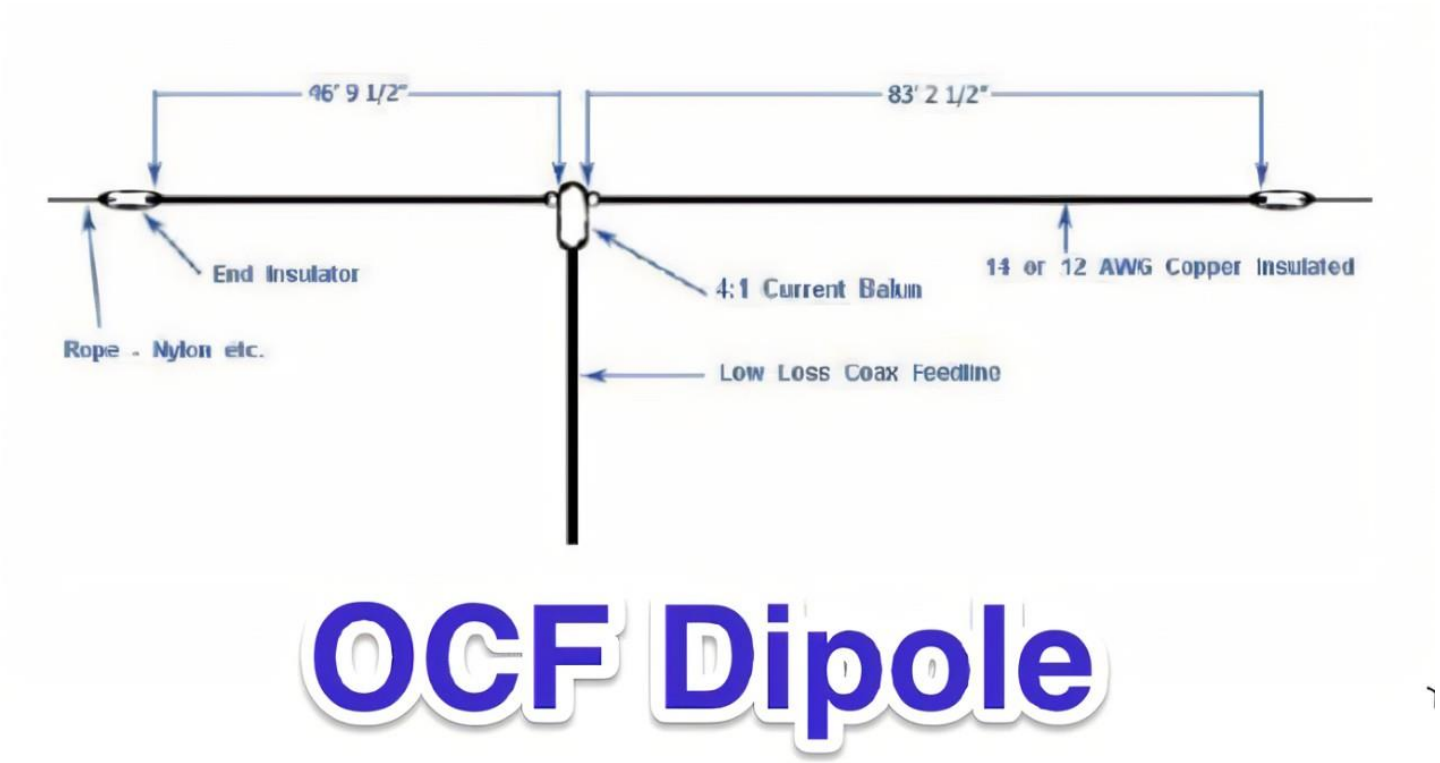
- **Reduced Bandwidth**: Fan dipoles have narrower bandwidth compared to some other multiband antennas. This limitation may affect their performance across certain frequency ranges.

- **Tuning Complexity**: Tuning fan dipoles can be tricky and tedious. Each dipole element needs precise adjustment to resonate properly on its designated band.

- **Size Considerations**: While smaller than some alternatives, fan dipoles still require space for multiple elements.

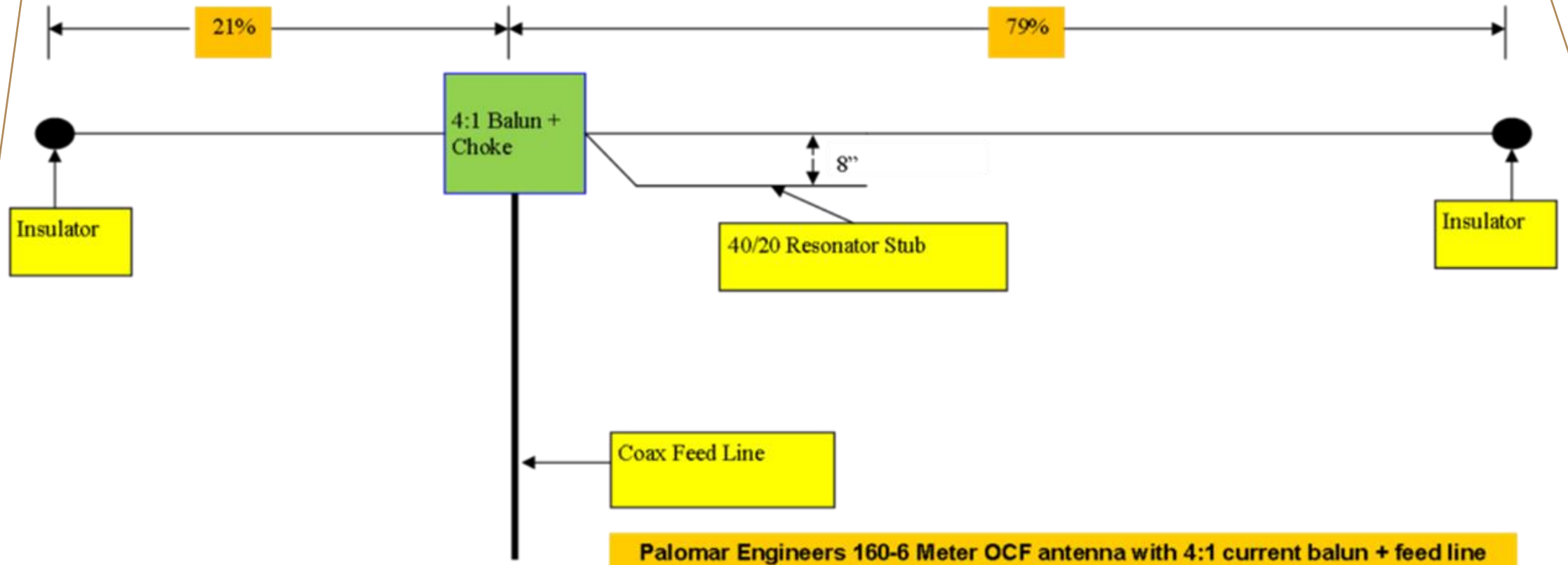
OFF CENTER FED DIPOLE (OCF)

OCF antennas are constructed according to a standard formula which places the feed point one-third of the way from one end, making two elements: one 33% and the other 67% of the total length. This results in low SWR on the lowest fundamental frequency for which the antenna is cut, and the *even* harmonics of that fundamental frequency–unlike a dipole which favors *odd* harmonics.



Off-Center Fed (OCF) Antenna: Multitalented or Misunderstood? (onallbands.com)

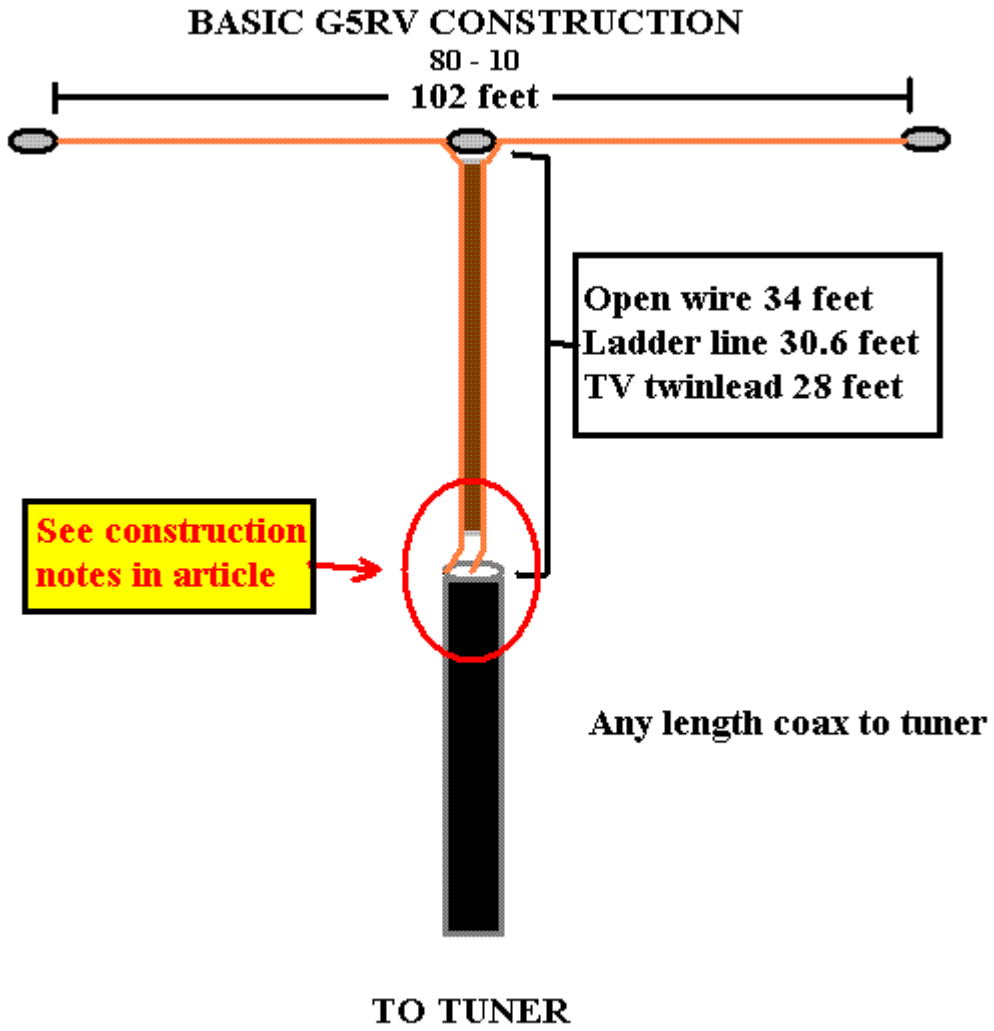
OFF CENTER FED DIPOLE (OCF)



Palomar Engineers 160-6 Meter OCF antenna with 4:1 current balun + feed line choke in single enclosure (CB-4-1500OCF)

160-80-60-40-30-20-17-15-12-11-10-6 meters
(some bands require antenna tuner)
Part # PAL-OCF16006 (234 feet)
Short side = 50 feet, Long side = 184 feet, 40/20 stub = 19.6 feet
www.Palomar-Engineers.com

G5RV ANTENNA

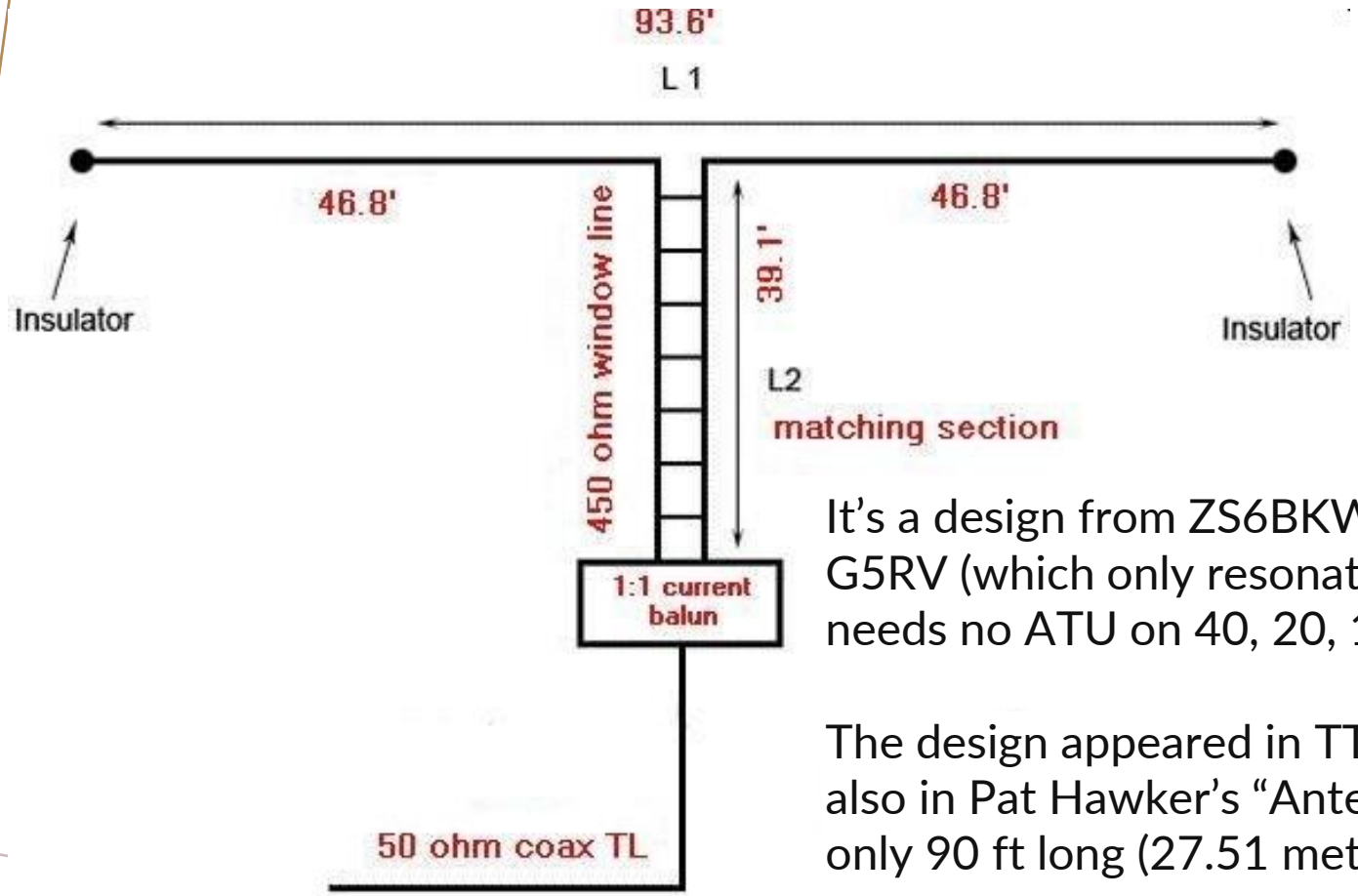


It was invented in 1946 by Louis Varney, whose call sign is G5RV ("SK" on June 28, 2000, age 89). Hence the name, the G5RV antenna.

The basic G5RV antenna measures only 102 feet across the top for 80 thru 10-meter operation and is fed at the center through a low loss 34 feet feed-stub.

The interaction between the radiating section and the feed-stub makes the G5RV usually easy to match on all-bands from 80 through 10 meters with an ordinary low-cost antenna tuner.

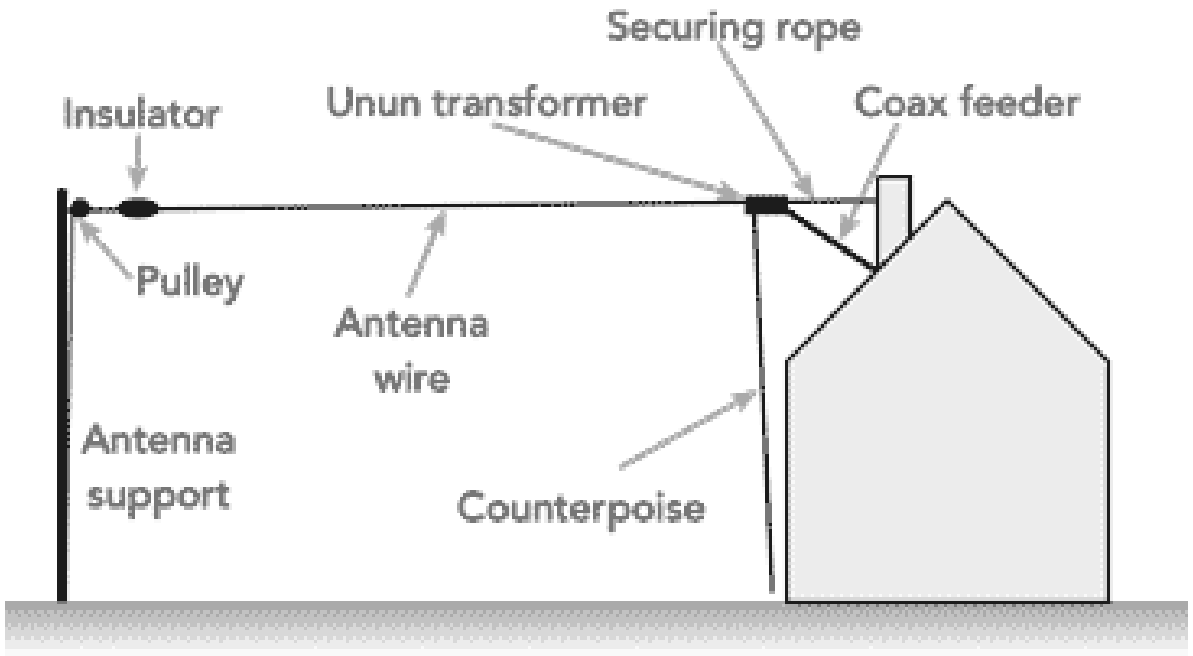
THE ZS6BKW MULTIBAND HF ANTENNA



It's a design from ZS6BKW (aka G0GSF), it's a cousin to the G5RV (which only resonates on 14 & 24 MHz), but better as it needs no ATU on 40, 20, 17, 12, 10 and 6 metres.

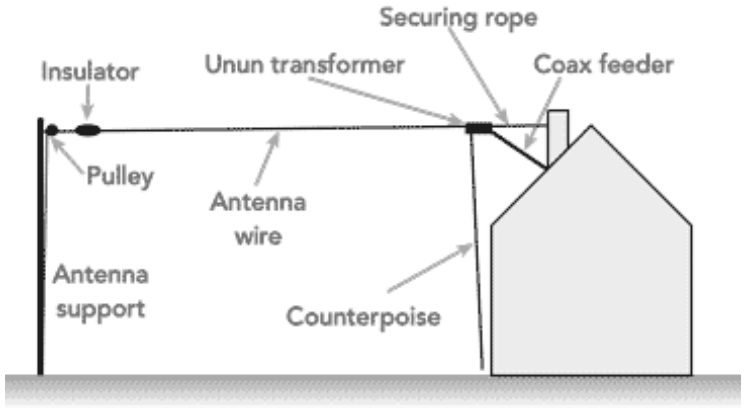
The design appeared in TT (RadCom) Jan & Feb 1993, but is also in Pat Hawker's "Antenna Topics" (publ. RSGB 2002) It's only 90 ft long (27.51 metres), with a 40 ft (12.2 m) downlead.

END FED HALF WAVE (EFHW)



Requires 49:1 Balun for EFHW, or 9:1 for random wire

RANDOM WIRE



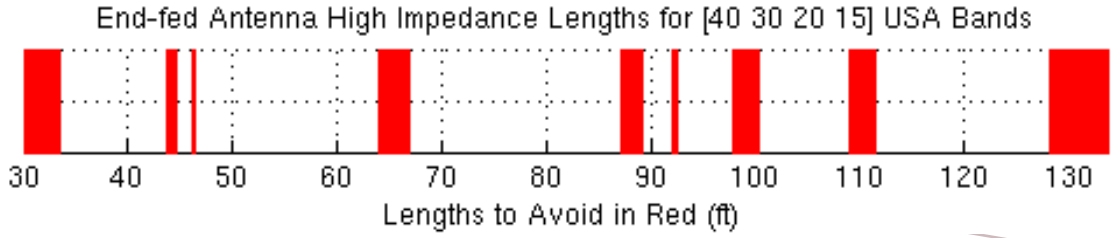
Random Wire Antennas:

Resonance: Random wire antennas are not resonant, meaning they have a high standing wave ratio (SWR) on most frequencies. They do not have a specific length that corresponds to a half or quarter wavelength.

Matching: A tuner is essential for matching the random wire antenna's impedance to your transceiver and minimizing SWR.

Efficiency: The efficiency of a half-wave end-fed antenna is better than that of a random wire because the higher feedpoint impedance results in lower current at the feedpoint. Unlike a quarter-wave random wire, it doesn't require extensive grounding efforts.

Voltage Point: Due to its high impedance a 9:1 balun is required.



WHAT WAS YOUR SIMPLE ANTENNA STARTING OUT?