

Modeling a Super J-Pole: A Look Inside a 5-Element Collinear Antenna

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Simulating a Super J-Pole: A 2m Antenna Analysis. This article describes a 5-element collinear antenna design for the 2m band, its radiation pattern, VSWR, and key components for optimal performance.

High-Performance Omnidirectional Antenna Design

The collinear J-Pole, also known as the **Super J-Pole**, offers significant performance improvements over a standard J-Pole antenna. This design boasts **increased gain** and improved **self-resonance** due to its unique feeding mechanism at the “J” section.

Technical Specifications

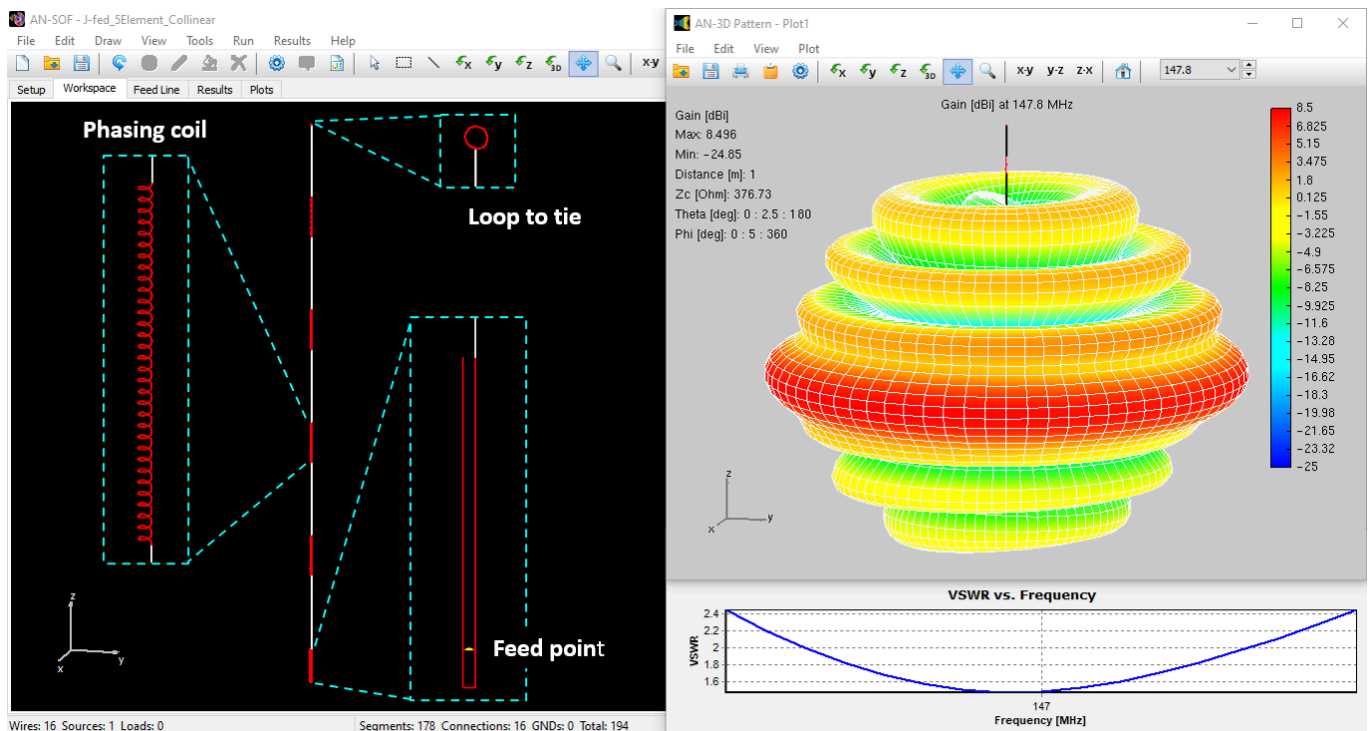
The Super J-Pole features **five collinear radiating elements** connected by **phasing coils**. Each linear element is a half-wavelength long, ensuring optimal performance at the target frequency. The phasing coils themselves are strategically designed with a length of one-quarter wavelength.

Convenient Feed Point and Impedance Matching

The feed point is conveniently located at the base of the antenna on a **J-dipole**. By carefully adjusting the position of the feed point along the J section, the Voltage Standing Wave Ratio (VSWR) can be minimized, **eliminating the need for an external impedance matching network**. This feature simplifies antenna construction and deployment.

Top Termination and Overall Dimensions

A **small loop** at the top end of the antenna serves as a **tie point**, measuring a mere 1/2 inch in diameter. The total length of the antenna is approximately **295 inches**. Each phasing coil features **32 turns** and has a diameter of **5/8 inches**.



AN-SOF simulation of a 5-element collinear Super J-Pole antenna designed for the 2m band. The left side displays the antenna model within the software workspace. The right side showcases the calculated 3D radiation pattern. The bottom right corner presents the VSWR curve.

Download Model

Detailed Antenna Model in AN-SOF

The figure accompanying this article showcases the antenna model within the AN-SOF workspace on the left. Additionally, the calculated radiation pattern (gain in dBi) is displayed on the right, along with the VSWR curve at the bottom right corner. To provide a closer look at the intricate details, the model includes zoomed-in views of a single coil, the top tie loop, and the feed point at the J section.

Importance of Accurate Coil Modeling

Accurate modeling of the phasing coils is crucial for optimizing the Super J-Pole's performance. Simulation software capable of handling **curved wire segments** and **closely spaced elements** is essential. **AN-SOF** offers the ideal solution with its **Helix wire function**, enabling the creation of a highly accurate model for each coil using **a single segment per turn**. This exemplifies the software's efficiency in simulating complex antenna designs.

See Also:

- [The 5-in-1 J-Pole Antenna Solution for Multiband Communications](#)
- [The Lazy-H Antenna: A 10-Meter Band Design Guide](#)
- [Extended Double Zepp \(EDZ\): A Phased Array Solution for Directional Antenna Applications](#)



About the Author

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RF ENGINEER & PHYSICS PH.D. With 25+ years in Computational Electromagnetics, I’m a passionate researcher focused on antenna modeling and design. As Founder of Golden Engineering LLC, I develop accessible, high-performance simulation tools that help RF engineers optimize their designs, educators teach complex concepts, and hobbyists bring antenna projects to life.

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