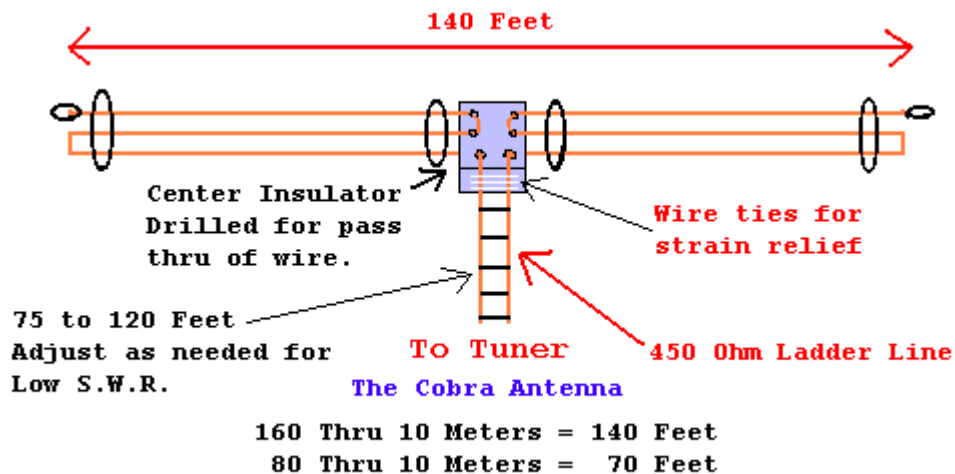


BUILD THE "COBRA" ANTENNA

By Raymond A. Cook W4JOH

Taken from and re-edited from a project in *73 Amateur Radio Today*, June, 1997

The original Cobra antenna designed by W4JOH is built using standard insulated wire of about 14 gauge and fed with 450 ohm ladder line down to the shack into a tuner. It got it's name from the S shaped configuration of it's multi-conductor elements. It performs on it's primary and harmonic operating frequencies as a standard ladder-line fed doublet.



N4UJW

The close spaced wire elements on each leg introduces two added resonant responses BELOW the antenna's fundamental operating frequency.

The 140 foot version (80 meters) in picture also resonates at about 2.8 MHz and also on 160 meters. A standard dipole at 1.9 MHz is about 246 feet total compared to 140 feet in the Cobra! This fact alone makes this an ideal antenna for restricted space on the TOP BAND! The half sized version, 73 foot (40 meter) also covers 60 and 75 meters! All band operation has been reported in the article to be excellent! (With a tuner of course) This antenna design extends the coverage compared to a G5RV both in bands and performance.

On its primary and harmonic operating frequencies, tests show no discernable difference in signal strength between a Cobra and a regular full-sized doublet or dipole. On its sub-bands bands where the Cobra is physically "short", efficiency is somewhat lower than for a full-sized dipole.

If you do the math, you will see that there is actually about 420 feet total wire across the top of the antenna on the 80 meter version, (210 feet per side), and about half that on the 40 meter version. The flattop and lead-in length were strictly determined by the physical limitations of the antenna farm and this project is a result of those limitations and the idea of compressing or folding the wire back on itself to fit the antenna farm. (No formulas were given in the article)

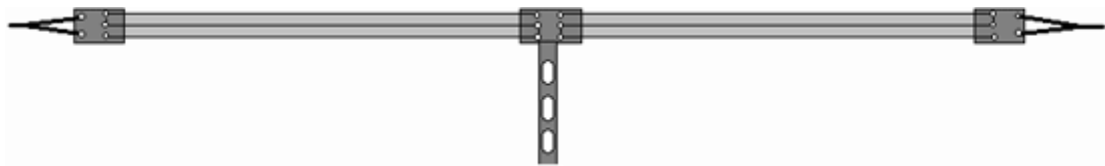
Keep in mind that there are actually 3 conductors connected in series per side and folded back on each other..... or another way of saying this is that there is one continuous length of 210 feet per side in the 80 meter version connected to one side of the ladder line and the same on the other half.

Because the Cobra antenna is a balanced load, it is recommended to install a 4:1 current-style balun at the station end of the feed line (many external tuners provide a built-in balun).

Ladder-line feed may have to be trimmed for lowest SWR, but using about a 100' length seems to make for easier tuning on all bands. Extra feed line should be suspended in loose coils and not in a tight roll.

Raymond is quoted from the article.....*"Some of our more skeptical, and perhaps knowledgeable, friends have expressed concern about impedance, power rating, wave-cancellation, etc. All that we can offer as an answer is the slogan used for many years by the Packard Motorcar Company: "Ask the man who owns one.""*W4JOH
<http://www.hamuniverse.com/cobraantenna.html>

<http://www.k1jek.com/>



UltraLite Senior: 160-10 Meters, 140 feet, \$89.95 + Shipping

UltraLite Junior: 80-10 Meters, 73 feet, \$85.95 + Shipping

- Covers More Bands than a G5RV.
- Light Weight, Won't Damage your Trees.
- Easy to Install.
- Handles a kW on All Bands.
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NEW! Unadilla 4:1 Baluns now available for \$25 each.

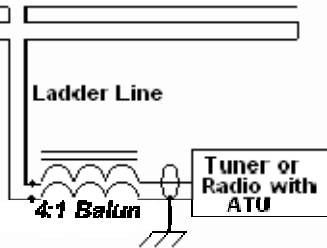
For more information, see the [Frequently Asked Questions \(FAQ\)](#) Page. Or, if you are ready to purchase, see the [How To Order](#) page. Please feel free to [contact me](#) with any questions you may have.

73 - Joe K1JEK
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Frequently Asked Questions

Where did the Cobra come from?



The original Cobra was a homebrew design introduced by Ray Cook, W4JOH, in 73 magazine. The Cobra name, unrelated to a well-known CB manufacturer,

came from the S-shaped configuration of the antenna's unusual multi-wire element.

What's special about a Cobra?

On its primary and harmonic operating frequencies, this antenna works identically to a ladder-line fed doublet. The big difference is, the Cobra's unique close-spaced multi-wire element also introduces two added resonant responses below the antenna's fundamental operating frequency. These responses extend frequency coverage far beyond that of a conventional doublet or G5RV. For example, the 140-foot (80-meter) Cobra also resonates near 2.8 MHz and on 160 meters. Similarly, the 73-foot (40-meter) Cobra also covers 60 and 75 Meters. Increasingly, hams are replacing G5RVs and other multi-band dipoles in order to realize the Cobra's extended coverage and great performance.

How efficient is the Cobra?

On its primary and harmonic operating frequencies, tests show no discernable difference in signal strength between a Cobra and a regular full-sized doublet or dipole. On its sub-bands where the Cobra is physically "short", efficiency is somewhat lower than for a full-sized dipole.

What is an UltraLite Cobra?

The original homebrew Cobra used unwieldy Romex house wire for its element--making the antenna difficult to handle and prone to breakage. UltraLite Cobras are different because they are professionally designed and engineered to survive New England's harsh winter climate. Weighing only four pounds including the feedline, they install quickly and pull up higher with far less stress on tree branches and support lines. At the same time, UltraLites are built to last! The black marine-grade ABS insulators won't deteriorate in sun or fracture in cold. All hardware is stainless. All wire is uV stable and pull-tested for strength. UltraLites come pre-assembled and ready to install with 100-feet of rugged copper-weld ladder line attached.

Do I Need a Tuner?

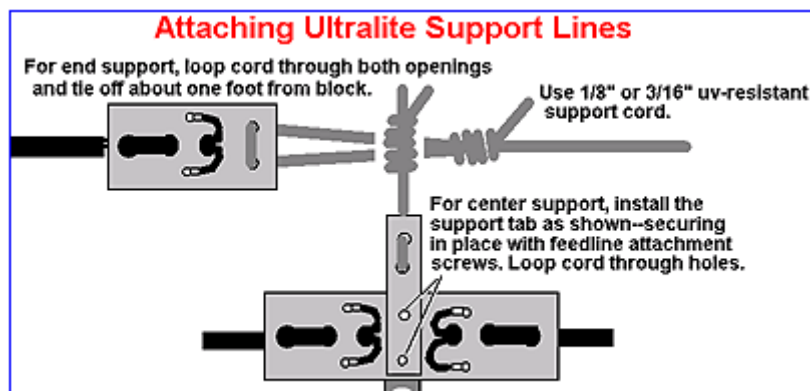
All Cobras require a tuner. In most installations, the auto-tuner built into your transceiver should provide sufficient tuning range. Because the Cobra presents a balanced load, we recommend installing a 4:1 current-style balun at the station end of the feedline (many external tuners provide a built-in balun).

Why Use a Cobra UltraLite at my QTH?

Most people install the Cobra because it does what no G5RV or multi-band doublet can do--add low-frequency coverage without taking up added space. Customers also report they can install the UltraLite higher using light-weight support line and expect it to "stay put".

How is a Cobra UltraLite Installed?

For best results, support with 1/8" (or 3/16") UV-rated cord. Loop cord through both end-block holes to reduce chafing. Install so center is 30' feet or more above ground--well clear of conductive roofing or house wiring. Avoid routing ladder line over metal surfaces, near parallel cables, or along the ground (if the feed must run parallel to a metallic support, twist it one rotation per foot to prevent proximity imbalance). For center support, install the included support tab on the center insulator using the existing feedline support screws. Simply remove the screws, position the tab on the insulator surface opposite the ladder line, and reinstall (see below):



[Click to Enlarge](#)

Ladder-line feed may be trimmed, but using the full 100' length generally results in easier tuning on all bands. Excess feed line should be suspended in loose coils rather than wrapped tightly in a roll.
