Ham 173 - Triad compactenna vhf-uhf

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Mission: *Establish reliable, lowest technical common denominator communications, locally & regionally, in a HOA.*

The Triad Antenna design has proven to be the smallest, lowest, very effective design for antenna systems. It consists of a vertical radiator and two counterpoises with specific design guidelines.

Mount. A convenient mount is an electrical octagon box, nominally 4" across by 1.5" deep. The box is rugged steel with eight sides, providing multiple configuration options. It is an indoor device, which must be sealed for exterior use.

Tools. The hand tools are a drill and 5/8-in drill bit,15/16-in open-end or adjustable wrench, Phillips screwdriver, and lug crimper. A soldering iron secures the crimp. Tuning employs an antenna analyzer.

Drill. Rotate the box so the two screws are horizontal. A short side is on top. Drill a 5/8-in hole to hold the antenna adapter.

Qty	Component	Size	Source	#
1	Radiator	Quarter-wave inductor	ham web	1
2	Counterpoise	Eighth-wave inductor	hardware	2
1	Mount	4" electrical octagon box	hardware	3
2	Lock washers, stainless	#8-32	hardware	4
2	Brass rod	0.125-in x 12-in	hardware	5
2	Fork spade lugs	AWG 12	hardware	6
1	Antenna adapter, insulated	NMO to SO-239	Amazon	7
1	Coax	RG8x <25', RG-213/U >25'	ham web	8
7	Ferrite snap-on, Mix31	Palomar FSB31-to fit coax	Palomar	9
2	Mounting screws	Support dependent	hardware	10

Radiator. The preferred radiator for base and mobile Vhf/Uhf is the 9-in COMPACtenna, a NLOS (not-line-of-sight) device. The small size and high performance are unmatched.

Elements. The counterpoises are a solid metal rod, preferably brass, 0.125-in diameter. Fit a fork connector over one end, crimp, then solder in place.

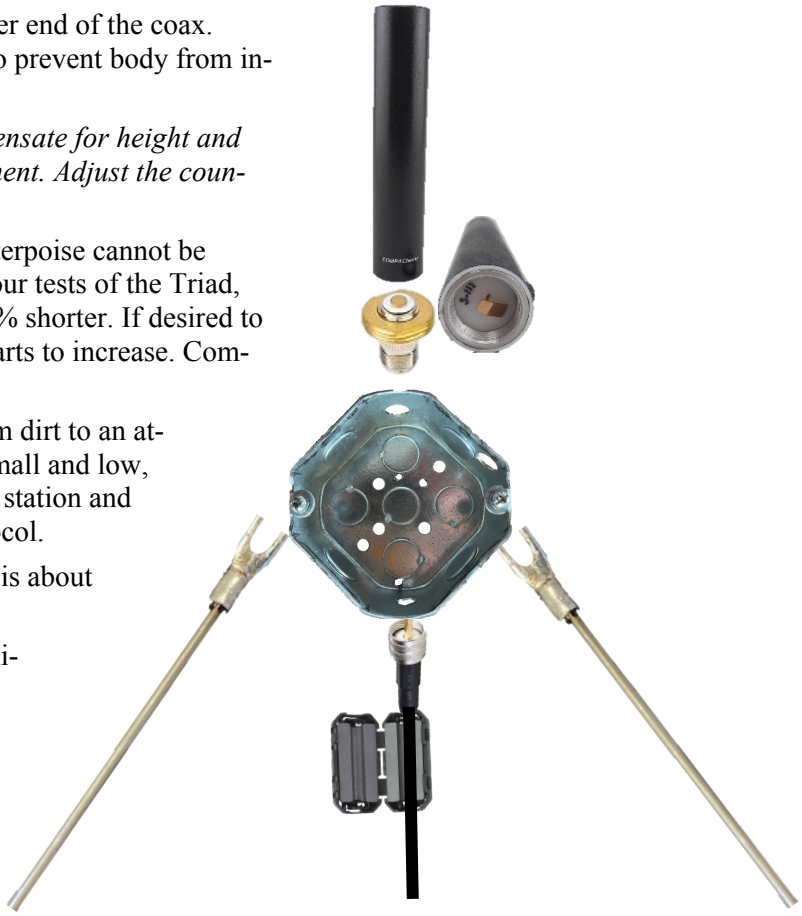
Assemble. Connect the antenna adapter through the top hole. Assure the feed-through is not shorted, but extends enough for contact. Connect the two counterpoises with an 8-32" washer. Orient at 45° down. Attach the radiator. Attach the coax to the antenna adapter. Just below the mount attach at least four Mix31 ferrite beads over the coax.

Install. Configure the antenna in its operating location, since the site influences the impedance, SWR, and pattern.

Analyze. Connect the antenna analyzer to the other end of the coax. When taking readings, stand away from the antenna to prevent body from interfering.

Key. *Because the counterpoise design is to compensate for height and shape, all three elements interact and require adjustment. Adjust the counterpoises for SWR.*

Tune. Since the radiator is fixed length, the counterpoise cannot be shortened as much. Traditional are 19-in long. From our tests of the Triad, near 12-in (λ/8) is better for steel. Brass is another 10% shorter. If desired to reduce further,clip off ¼" at a time, until SWR just starts to increase. Compare, a Diamond DX-50 has 7-in counterpoise.



Altitude. The device can install at any height from dirt to an attic. One notice is important. Since the antenna is so small and low, the user may be tempted to place it near the operating station and people. Evaluate the health effects using normal protocol.

Cost. Radiator, adapter, counterpoise, and mount is about $130.

Results. Construction is straightforward with minimum tools. With radiator height of 9-in and counterpoise about 12-in and flat, this is the smallest, high-performance Vhf/Uhf antenna.

Refer to the article on background for the technical reasons of why the Triad is so effective and has performance characteristics unmatched by any other system.

Life is good. Enjoy!