

One of the best things about reading the results of someone's cut-and-try experiments is that you wind up with something that works. With 160 meter activity increasing, you can easily take advantage of W4TWW's work.

The W4TWW Coaxial Inverted "L" Antenna For 160 Meters

BY COLEMAN B. ROWLAND, W4TWW, AND JAMES E. MCQUEEN, JR.*, WB4LJP

I have been active on 160 meters since 1951, and I have tried many antennas for this band. Many of these antennas use some form of tuning network and cover only a portion of the band.

Several years ago when the restrictions began to be lifted on 160 meters, I started looking for a broad-band antenna that would cover the entire band. At one point in my research I remembered the double bazooka which I had used on 80 and 40 meters. I wondered if an adaptation of the bazooka might work as a 1/4-wave vertical on 160 meters. As a result of my experimenting came the coaxial inverted "L" antenna, which provides vertical polarization and covers the entire band without tuning networks.

The antenna was developed from an article which appeared in the 1976 edition of *The Radio Amateur's Handbook*. The article described a broad-band dipole, or the double bazooka. The inverted "L" uses the same principle and techniques.†

Much has been written about the original antenna design in amateur radio publications. The consensus of opinion seems to be that it was not really as broad-banded as originally thought. Not being an antenna design engineer, I can only provide the following information gathered from my own experiences with this antenna.

The antenna provides complete coverage of the 160 meter band without any modification. At the design frequency of 1.840 MHz the s.w.r. is a perfect 1.1:1. At 1.8 MHz the s.w.r. is 1.3:1, and at 1.998 MHz the s.w.r. is only 1.5:1.

With all the discussion about s.w.r. I think it's necessary to make the following comment. My dummy load gives excel-

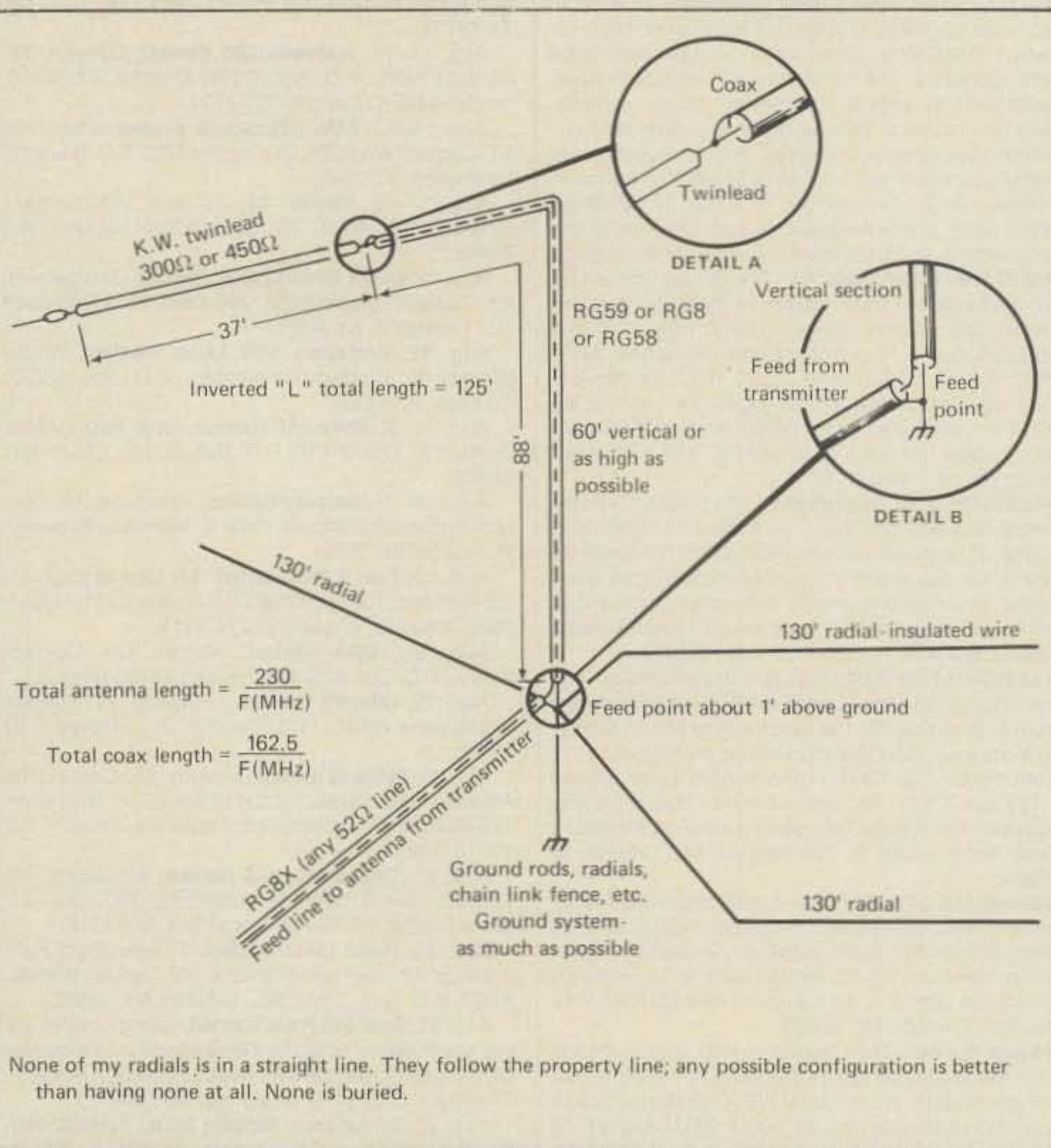


Fig. 1—Details for constructing the coaxial inverted "L" antenna for 160 meters.

lent s.w.r. at all frequencies, but it leaves much to be desired in radiation efficiency. The antenna not only exhibits good s.w.r., it also radiates an excellent signal.

In my many contacts on 160 meters I am frequently asked to describe the type of antenna I am using. When I say I am using the coaxial inverted "L," I get requests for a description of the antenna and its construction.

I would like to clarify several areas in which questions frequently arise. First, the portion of the antenna which uses the twinlead does not have to use it. The entire antenna can be built from coax; however, as shown in Detail "A," the braid must be shorted to the center conductor at this point.

Another area concerns the number of ground radials that must be used to make

*516 Holly Dr., Eufaula, AL 46027

†Robert Myers, ed., *The Radio Amateur's Handbook*, 56th ed. (Newington, CT: The American Radio Relay League), pp. 599-600.

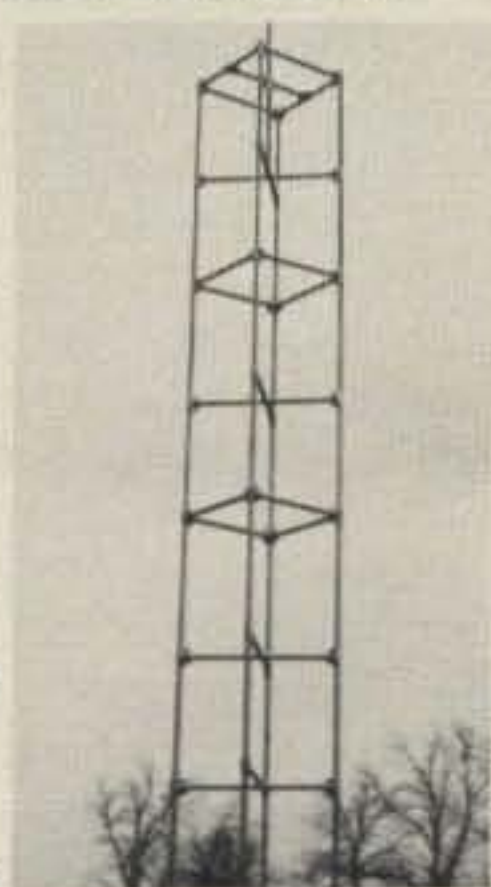
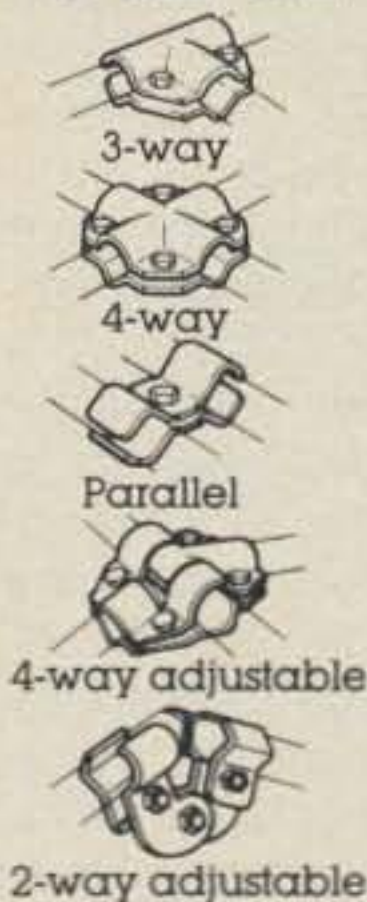
the antenna perform satisfactorily. I operate the antenna with several radials of different lengths to accommodate them on my property. None of the radials is buried, and not all of them are in a straight line. It is important to have a minimum of two or three radials exactly 130 feet long so the antenna will resonate correctly against the ground system, but you may add as many as you wish.

When you've finished tuning the antenna, an excellent way to determine if your ground system is up to par is to measure your s.w.r. and note it for future reference. The next time your location receives a good rain and the ground is wet, measure the s.w.r. again. If the s.w.r. remains the same, the ground system is sufficient; however, if the s.w.r. changes at this time, you need to add more ground radials. Once the s.w.r. does not change during periods of dry or wet weather, the ground system is sufficient for all practical purposes.

Many antennas of this type have been constructed in the last few years. Most have obtained excellent results. Here's hoping you enjoy this antenna as much as I have, and your results are as excellent as mine.

Special thanks to NV4I for helping to install my many antennas, to WB4LJP for the presentation of my material, and to the many amateurs who have helped in the refinement and testing of this antenna.

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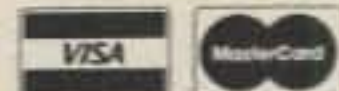
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