Try a Bi-Loop Antenna

—gets you coming and going

Two loops are better than one.

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This antenna design has performed as well as a 3-element beam on 144 MHz and better than a 2-element full-size yagi on 14 MHz. The idea for this design came from the antenna described by ZF1MA in the December, 1976, issue of *73*. The bi-loop configuration needs to be more or less exact to get the best performance.

Having used single loops in the past and noted their ability to reduce man-made noise, I decided to try for more gain—and still keep the closed loop design. My first experiment was on 144 MHz. It took me a whole ten minutes to nail some 3/4" x 3/4" sticks together and tack a test antenna in place. The antenna was compared with a 3-element yagi on the Lookout Pass repeater, 80 miles distant. The Clegg FM-28 S-meter readings were slightly higher with the bi-loop. Results were repeatable, so it was decided to try the 14-MHz configuration between a couple of poles. In nearly all cases, there was an improvement in signal strength of 1 to 2 S-units over my full-size 2-element yagi. With some signals coming from high angles, there was no difference in signal strength. With low-angle DX signals, though, there was a definite improvement over the yagi. The polarization was vertical.

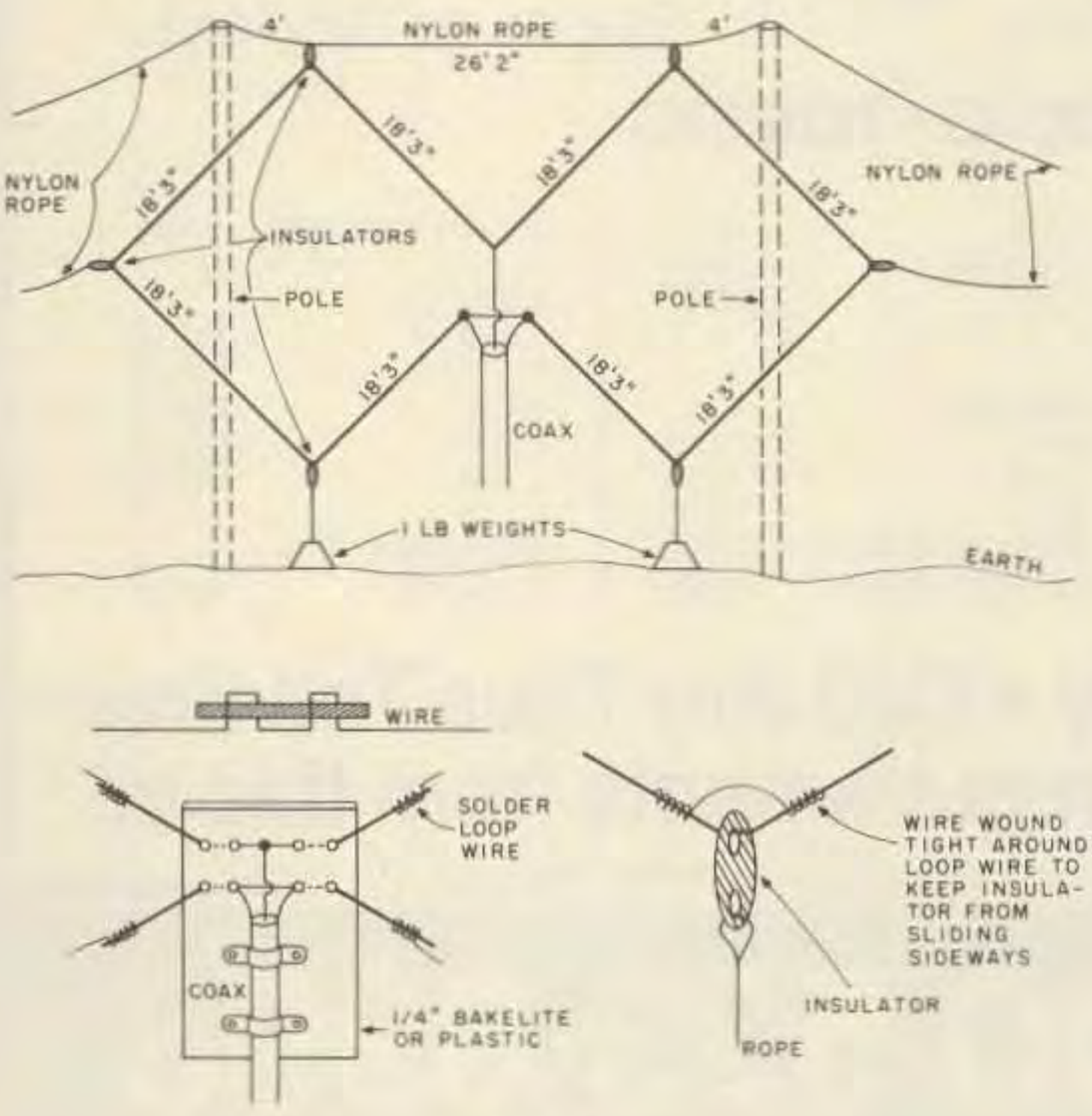

Fig. 1.

The normal impedance of a single loop is slightly over 100 Ohms, so when two such loops are fed in parallel, the impedance comes close to a good match for 70- or 52-Ohm cable. This impedance will vary slightly with the height above ground.

As mentioned above, the loops need to be adjusted to an almost-perfect square for best performance. When the extreme ends of the loops were stretched out in a diamond shape to raise the bottom of the loop higher above ground, the low-angle gain fell off in comparison with the yagi.

The lower corner of each loop is only 6 feet off the ground and is kept in place through the use of a one-pound weight which just touches the ground when the loop is taut. Raising the entire array should further improve its performance.

This antenna is simple to build and performs well in two directions. There are deep nulls in the plane of the loops. The maximum radiation is broadside to the wire. Each loop is made up of 73 feet of #14 enameled wire, which makes each side of the loop 18'3". Use lightweight ceramic or plastic insulators and depend on nylon rope for additional insulation. The insulator which terminates the coaxial feedline is shown in detail in Fig. 1. ■

14.00 MHz	1.2:1
14.05 MHz	1.1:1
14.10 MHz	1.0:1
14.15 MHz	1.1:1
14.20 MHz	1.1:1
14.25 MHz	1.2:1
14.30 MHz	1.25:1
14.35 MHz	1.3:1

Table 1. Swr readings for the bi-loop antenna. Readings on 7 MHz and 21 MHz were high (at least 7:1), but from 28.0 MHz to 29.0 MHz, the swr was almost constant at 1.8:1.