

Chapter 4

VHF Hunting with Directional Antennas

Despite the many specialized DF units now available, many expert vhf hunters still stay with their directional antennas and S-meters. What this system lacks in convenience is made up for by simplicity and the ability to hunt very weak signals with high gain antennas. In this chapter we'll cover a number of antenna schemes for vhf. We'll even show you how to get hunting today with a vhf loop. You'll see how easy and fun antenna experimentation is.

SIMPLE VHF ANTENNAS

Let's say that the local radio club is having its first 2 meter fun hunt on Saturday afternoon. It's Saturday morning now and you'd like to see if T-hunting is as fun as it sounds. Lots of work ahead? No. While you may not have the time or inclination to build a quad, attenuator, and mobile mount, you and a friend can still be part of the action, if you have a receiver with S-meter. It only takes a couple of hours to build and tune a loop antenna and become a transmitter hunter.

TWO METER LOOPS

This beginner's antenna was designed by Dick Reimer, W6ET, and passed along by John Gallegos,

W6EQ, who has used it to successfully find both hidden T's and a jammer. All you need to build it are a broomstick, a 10 picofarad trimmer capacitor, a small piece of perf board, six feet or so of coax with a connector for your rig, an alligator clip, and about three feet of solid AWG 12 copper house wire. A piston trimmer works best for the tuning capacitor, but an air or ceramic type can be used.

Mount the capacitor to the perf board. Form the solid wire into a loop and connect the ends to the capacitor terminals, as shown in Fig. 4-1. (Don't hook up the vertical sense antenna yet.) Secure the loop to the perf board for mechanical rigidity. Mount the loop to the broomstick mast. Five-minute epoxy glue is good for securing these parts. Connect the coax shield to the loop at the point exactly opposite the capacitor. Connect the center conductor to the gamma match as shown. It's done!

This antenna is about 0.3 wavelength around. It is much larger in terms of wavelength than the hf loops discussed elsewhere in this book, yet it acts like a small loop in its directivity. Figure 4-2 gives the pattern. Its sharp resonance gives it amazing sensitivity for its size. It has produced higher S-meter readings, when held above W6ET's car roof, than did a 5/8-wavelength magnetic mount whip on the rear deck.

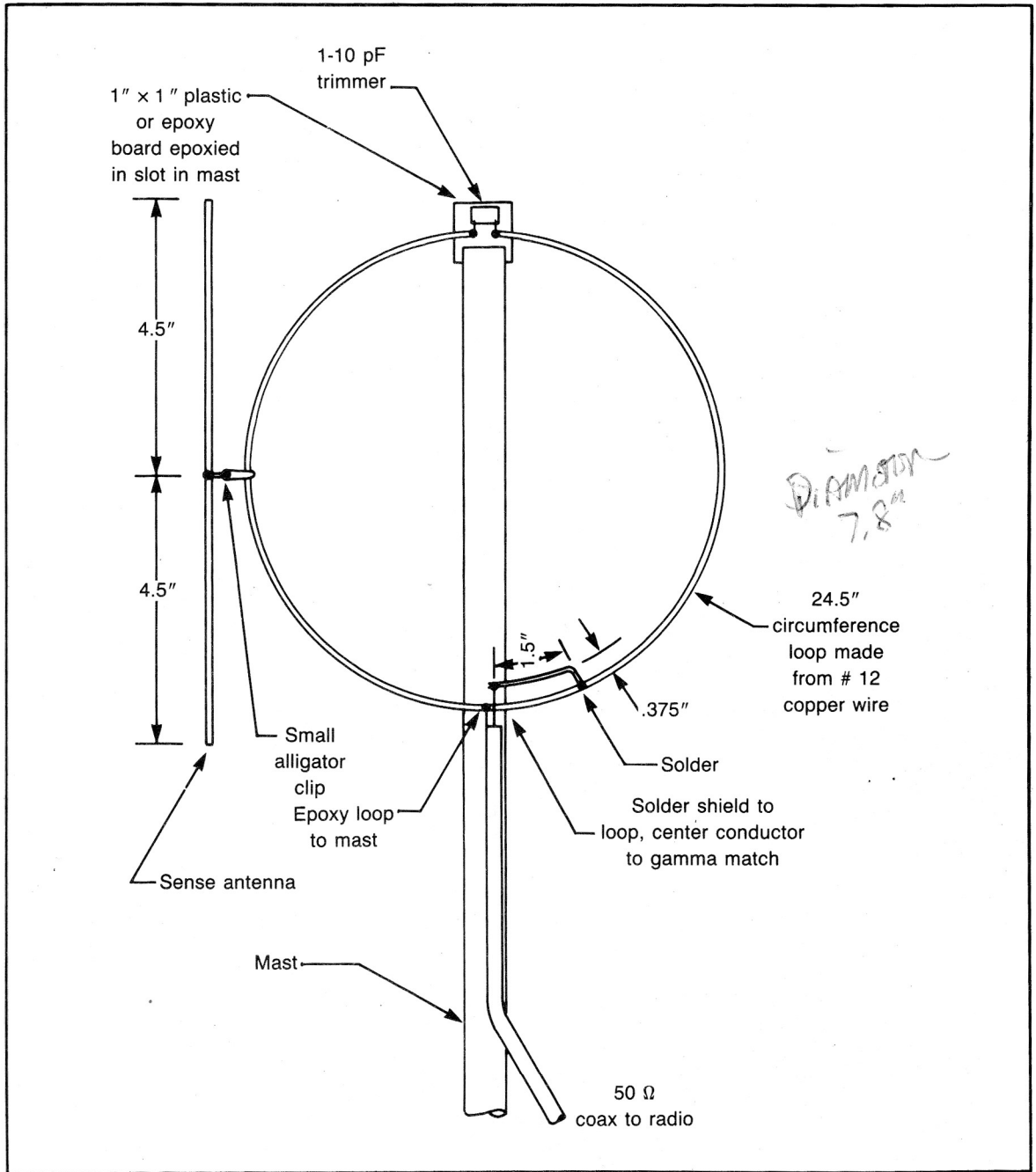


Fig. 4-1. Construction details for a simple 2 meter loop.

An electrostatic shield is not necessary or desirable on this particular loop. The higher you can get it above the car, the better it will work. Nearby objects won't have

as bad an effect on pattern as they will with a loop on hf, because the objects are further away in terms of wavelengths. Still, it performs best when out in the clear.

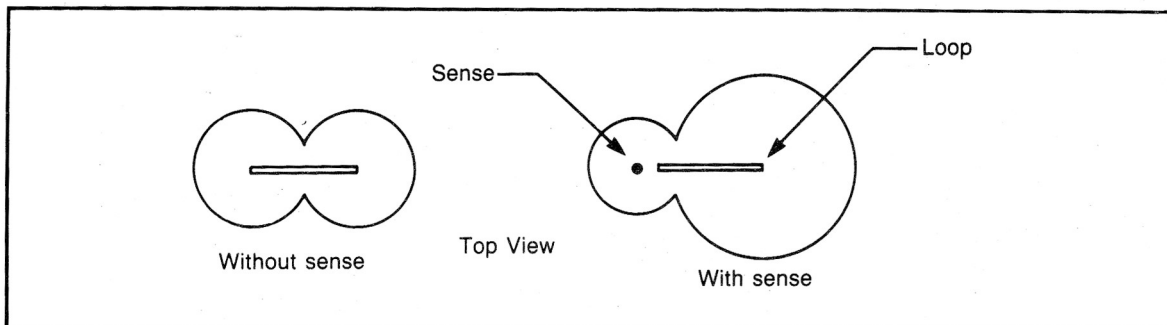


Fig. 4-2. Pattern of the simple 2 meter loop, both with and without the sense antenna, seen from above.

Use the local repeater as a signal source to tune the loop. Hold it end-on to the direction of the repeater antenna (one maximum lobe) and tune the capacitor with an insulated tuning tool for maximum signal. Tune slowly and remove your hand after each adjustment, as coupling to your body affects the adjustment. You may be able to improve performance by experimenting with the gamma match dimensions. Do not transmit into the loop. (Disconnecting the microphone prevents accidental transmissions.)

Though many experienced hunters prefer to work alone, you'll want to team up for this first hunt. The passenger holds the loop upright out the window and spins it slowly. For weak signals, hunt the peaks, which are in the plane of the loop (off the ends).

With stronger signals, hunt the nulls. They should be sharper and at exact right angles to the peak. They may be disguised or in the wrong direction due to interaction with the car and other antennas, however. Stay in the clear, away from fences and power lines when taking bearings, as they can upset nulls, too. Get some experience taking readings on the local repeater from several locations before setting out for the hunt.

One of the biggest problems with this simple loop is its bi-directionality. Is the signal in front or in back? One sneaky way for a beginner to tell at the starting point is to look at the direction all the quads and beams are pointing. Then drive a course that always keeps the bunny ahead of you, never letting him get more than 90 degrees left or right.

In the early days of hunting most hunters used these bi-directional loops. When they had a choice, they started the hunt from the edge of the boundary area instead of the center, so that the 180 degree ambiguity would not be a problem. Of course they were often a very long way from the fox because of starting at the boundary.

Fortunately there's a better way. The loop can be

made somewhat unidirectional. Clip the nine inch sense wire to the side of the loop as shown in Fig. 4-1. Now rotate the loop and notice that the signal peak on one side is much higher on the meter than on the one 180 degrees around. When oriented for the higher peak, the vertical rod will be on the side away from the hidden T.

Adding the vertical rod detunes the loop, decreasing its sensitivity by several dB. This is no problem unless the signal is very weak. The vertical sense antenna may not give proper unidirectional response if there is a high horizontal polarization component to the incoming signal.

Although this loop method will get you started in hunting (and maybe even win a hunt or two), it is admittedly crude. You'll soon be eager to improve your system. But don't throw your loop away then—keep it in the trunk. You may be glad you have it when your fancy wire quad gets mangled by a low hanging branch in the middle of a hunt.

OTHER INSTANT HUNTING IDEAS

Is the mini-loop the simplest directional antenna? Nope. Chuck Tavaris, N4FQ, reports that some hams in the Roanoke, Virginia, area have tried "The Garbage Can Emergency Antenna." They stick their magnetic mount whips in the middle of the inside of a galvanized iron garbage can lid. This contraption becomes a handheld DF antenna, held by the lid's handle like a knight of old would hold his shield.

Of course the polarization is wrong, the antenna pattern is wrong, and it can only be used outside of the car. But some say it works, sort of. It probably does best at hunting the null behind it. Keep it in mind as a last resort.

The idea of using a solid reflector to obtain directivity does have its merits, however. A proper metal shield behind a handheld radio can make a simple DF system. Try making a curved reflector out of corrugated cardboard