

Cheap and Portable Loop

...for 20 through 40 meters.

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This is the ultimate minimal-cost and minimal-construction loop antenna. It is portable and can be quickly disassembled and tossed in the trunk or on the rear seat of a car—yet it is large enough to give a good account of itself when you are operating QRP (although you would need a sturdier variable capacitor if you wished to exceed 10 or 15 watts). Finding components for it in the basement and building it took less than two hours.

The circuit design

The circuit design is quite simple. There is a main loop in series with a trimmer capacitor (20–180 pF) and a feeder loop about one-fifth the size of the main loop. **Fig. 1** shows the circuit. Ocean State Electronics has such a capacitor (#TC-463). Their phone number is (800) 866-6626.

Constructing the antenna

The main loop is made of solid insulated #12 house wire. #10 is worth a try, but I was using what I could find in the basement. This loop is 144 inches long. The feeder loop is made of the same wire and is 28 inches long. The

wire of the loops is mounted by means of pieces cut from a terminal block (Radio Shack #274-678). The three pieces needed are cut so that they each have two connector terminals and a hole that accepts a small wood screw. These sections are then fastened to the support mast.

The mast is a three-quarters-inch by one-half-inch hardwood trim strip four feet, four inches long. The base is made from one-inch-thick pine board built up in the center by means of a smaller piece of the same board. A rectangular hole cut in the center of the built-up base should be a tight fit for the mast. This way the parts can be easily pulled apart for transporting. See **Photos A and C**.

The capacitor is soldered to two short pieces of #12 bare wire so that it can be inserted in the terminal block mounted at the top of the mast. The heavy wire provides the rigidity needed when the capacitor is being tuned. See **Photo B**.

The second block is mounted at the bottom of the mast to hold the bottoms of both loops (**Photo C**).

The main loop is divided into two parts. About half an inch of insulation

is removed from the ends so that they can be inserted in and held by the blocks. The top block connects the loop halves in series with the capacitor. See **Photo B**.

The bottom block connects the two halves together. When the halves are

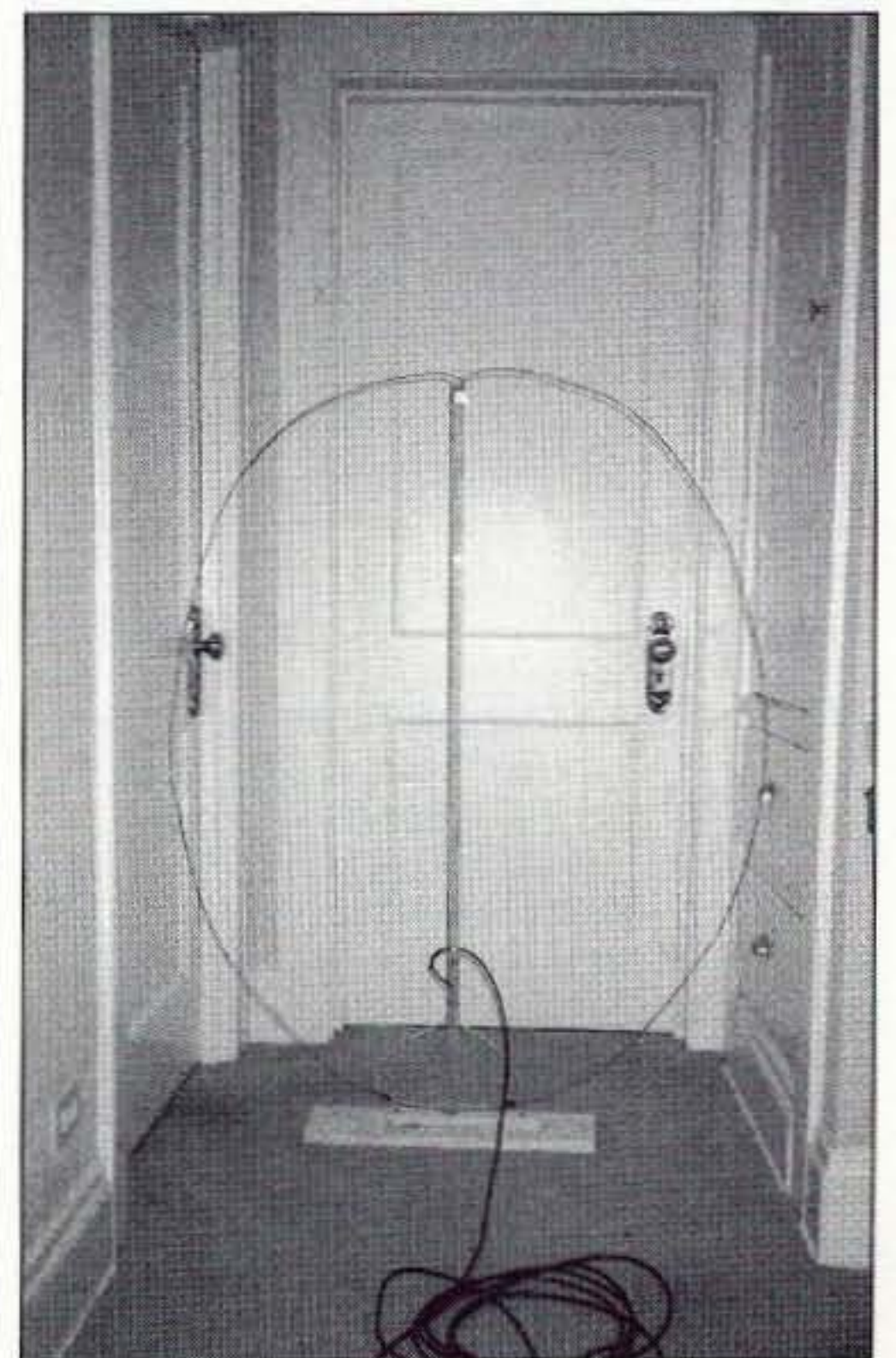


Photo A. General appearance of the portable loop.

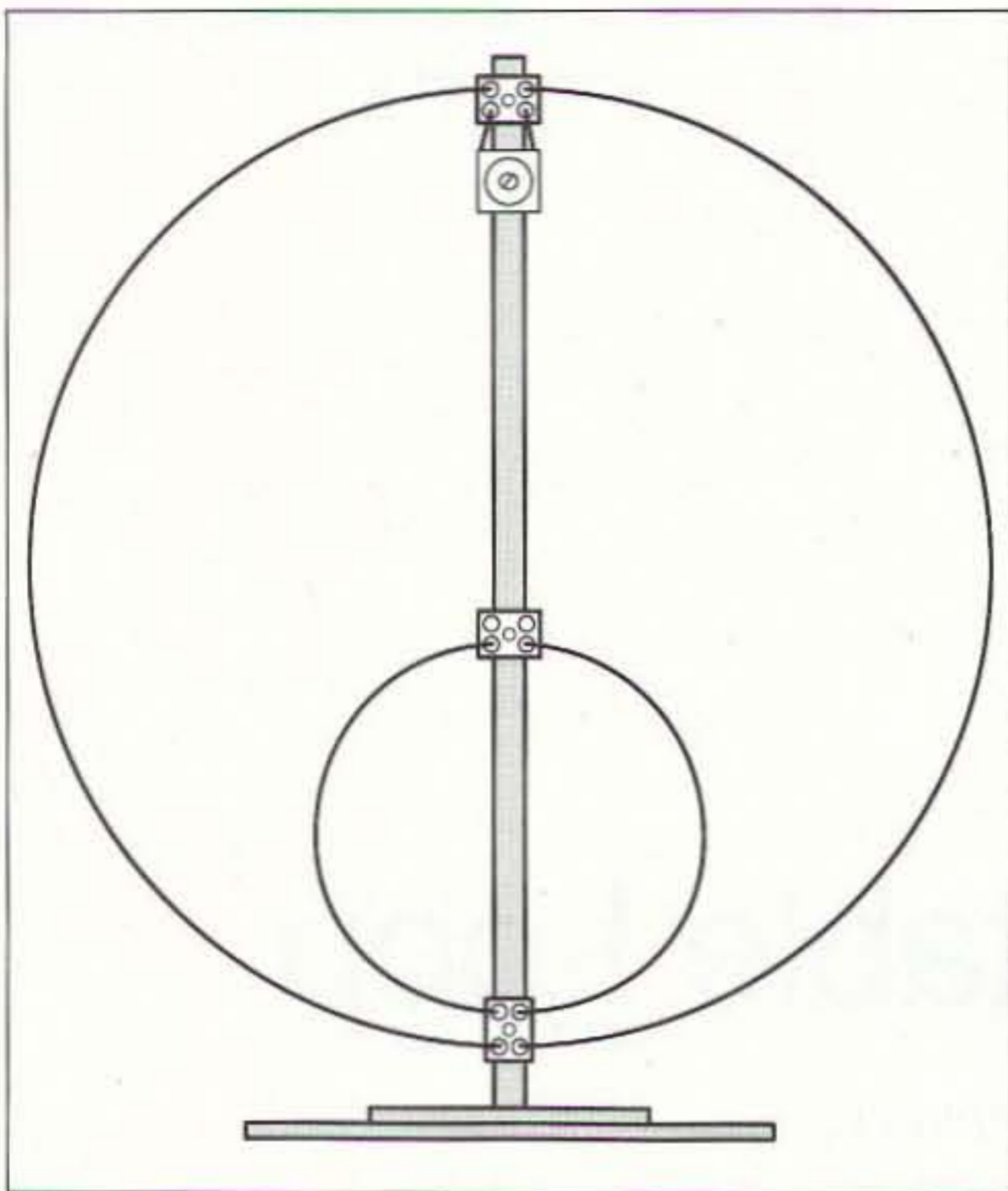


Fig. 1. The loop circuit.

attached, the wires are bent into an oval shape. The loop can keep its shape without a crossbar when used inside a building. Using it outside in the wind requires more rigidity and a clamp to hold it to something like a picnic table. If you toss it in the car for a trip, you may have to reshape it a little before use.

possible on either side of the block. I taped the loops together for close proximity and rigidity (Photo C).

Tuning and operating the loop antenna

The loop can be tuned to a specific frequency by connecting it to a receiver which is set for the frequency to be used. Using an alignment tool (such as the Antique Radio Supply #ST-8609 or just a thin dowel sharpened into a screwdriver), tune the trimmer capacitor until you hear background noise or a signal. Maximize the noise or signal. Final tuning can be done by transmitting at low power when the frequency is clear and adjusting the trimmer until a field strength meter is maximized. A quicker and cleaner way is to use an antenna analyzer to get the best SWR.

Placing an antenna tuner and an SWR meter in the line will help to protect your rig and give a greater range of frequencies without retuning the antenna itself. Avoid touching the antenna during transmissions. Touching any open metal on the antenna could cause injury even with low power.

The loop is designed to be used in the vertical position. This allows the loop to be used when placed near the ground or something that acts like a ground plane. This position has the

A third terminal block is positioned high enough above the bottom of the main loop to hold the top of the feeder loop. This loop is also divided into two halves for mounting. This terminal block also connects the coax to the feeder loop. The coax is secured to the mast by means of a piece of Plexiglas™ and a wood screw. The coax should come out from the mast as close to a right angle to the plane of the loop as possible. See Photo C.

The bottom of the feeder loop connects through the top connector of the bottom terminal block section. Bring this loop as close to the bottom of the main loop as possible

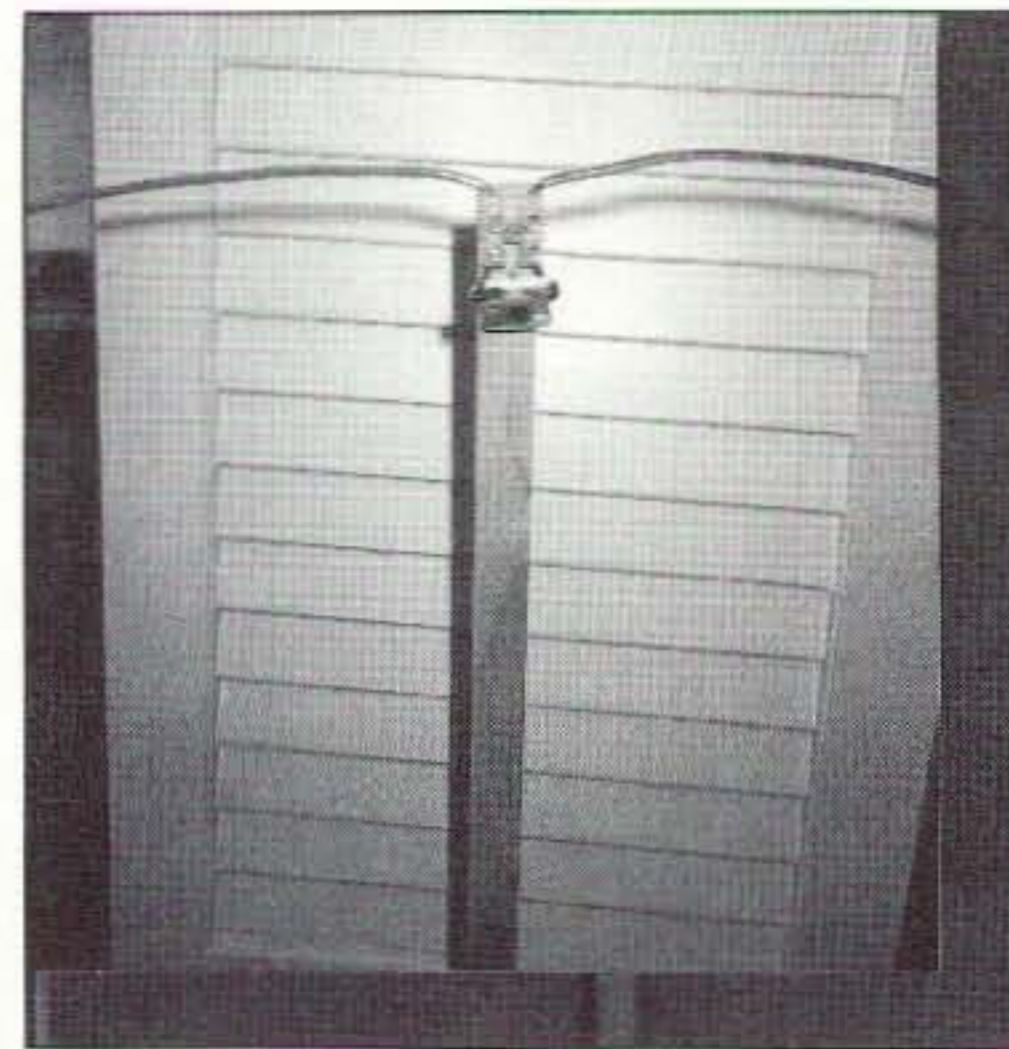


Photo B. Top connections of the portable loop.

added advantages of providing a null perpendicular to the center of the plane of the loop, as well as gain in the plane of the loop.

Important considerations

The antenna is designed for indoor use, but with a crossbar, a cover on the capacitor, and a clamp to hold it down to a picnic table or any nonmetallic flat surface it could very well be used outside. If you live in a building that contains a lot of metal in its construction (e.g., steel and concrete, aluminum siding, etc.), then you will need to get the antenna outside of the building. Also, it should not be placed near a mass of metal.

It works fine

If tuned properly, the antenna works quite well using a couple of watts. I've even made some local contacts with it using a NorCal 40-9er running 150 milliwatts. I got good reports, but then again, they were within 50 miles—with as much as five watts you could "work the world!" 73

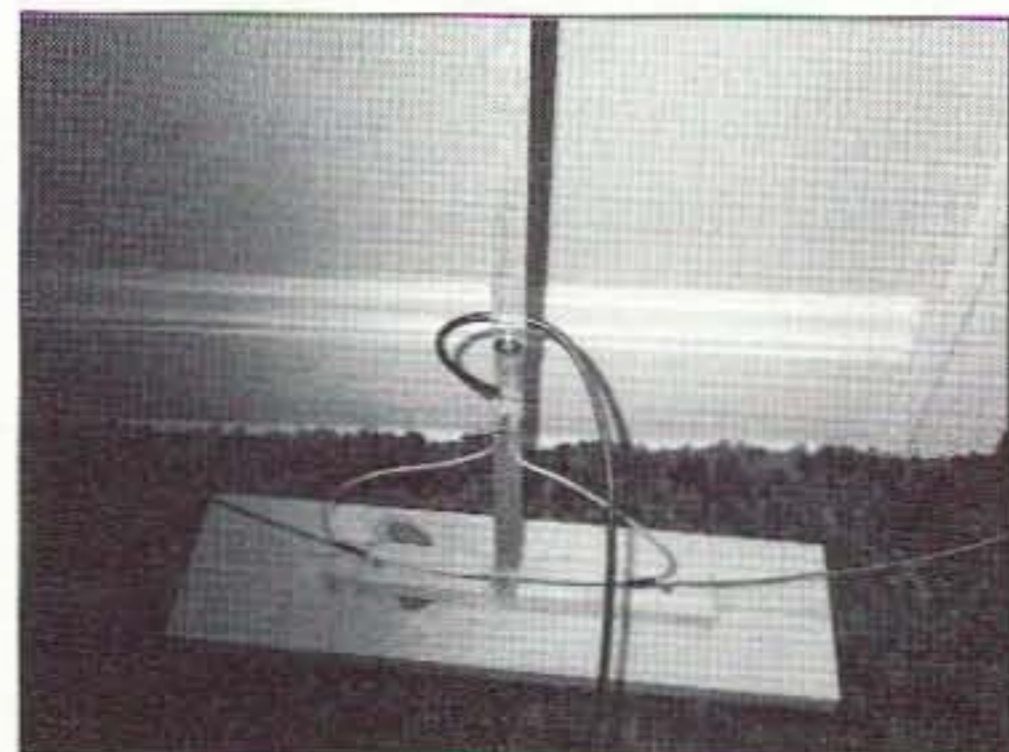


Photo C. Base and base connections of the portable loop.

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