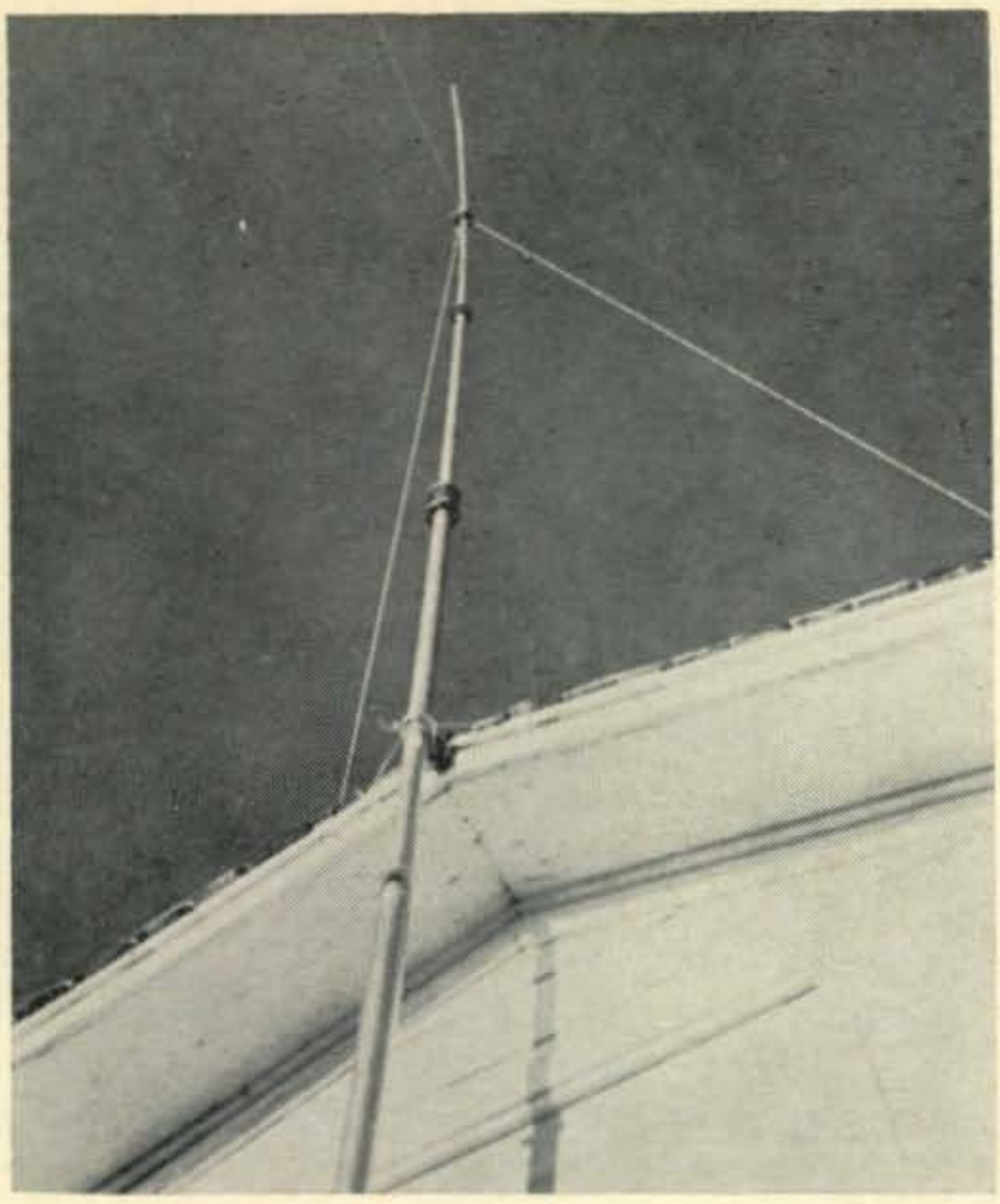


View of the half wave 40 meter vertical antenna. A standoff insulator on the edge of the roof and three nylon ropes provide adequate support.

A HALF WAVELENGTH VERTICAL

BY W. E. LA FARRA,* W5ZCC

This simple vertical is a half wavelength on forty meters and a quarter wavelength on 75 meters. Its construction is simple and inexpensive.

WITH the sunspot cycle past the minimum and on the upswing, we can all look forward to the high bands opening again, but this time is yet several years away. In the meantime we will have to settle for the bands we have. Of course every ham has his own pet band and pet antenna. We have tried most of the antennas: beer can, ground planes, loaded whips, and we're looking for something different. Since we are lazy, live in a small town, and have a limited budget, we had to give up some of our wilder dreams.

What we had in mind was an antenna that would be inexpensive, easy to construct from locally available material, and would perform when it was finished. For some time now we had been dreaming of a half wave vertical antenna especially for forty meter operation, and without the matching network this antenna would then serve as a quarter wave for seventy-five meters. These two bands have good DX openings at this stage of the sunspot cycle. After thinking about the ½ wave vertical for forty, we just had to give it a try.

*P.O.B. 43, McGehee, Arkansas.

Construction

Technically the antenna has several good advantages, low angle radiation, easy matching, *etc*. Construction wise we decided on a fifty foot telescoping TV mast, utilizing TV mast extension to complete the necessary 64 feet.

First the mast was placed on the ground and the 64 feet measured correctly. Each section was then marked so that the same measurements would hold true once we stood the assembly in the air. All top sections were pulled completely out, and the bottom two sections were used for adjusting to frequency. Since each section clamps together, we decided to solder a piece of braided wire at each joint to give a good electrical contact.

With the ½ wave vertical antenna, a matching coil and capacitor is needed as the impedance

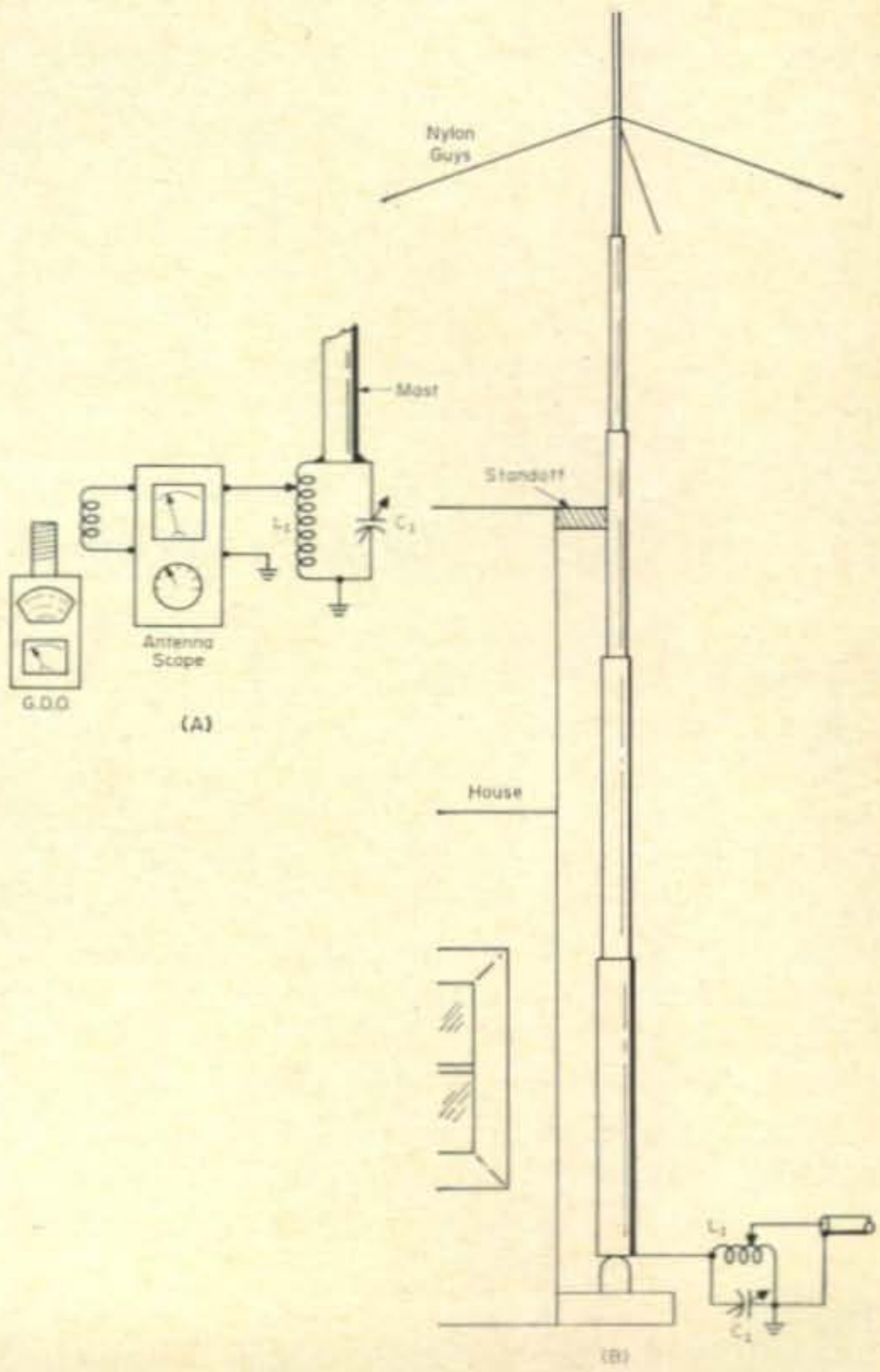
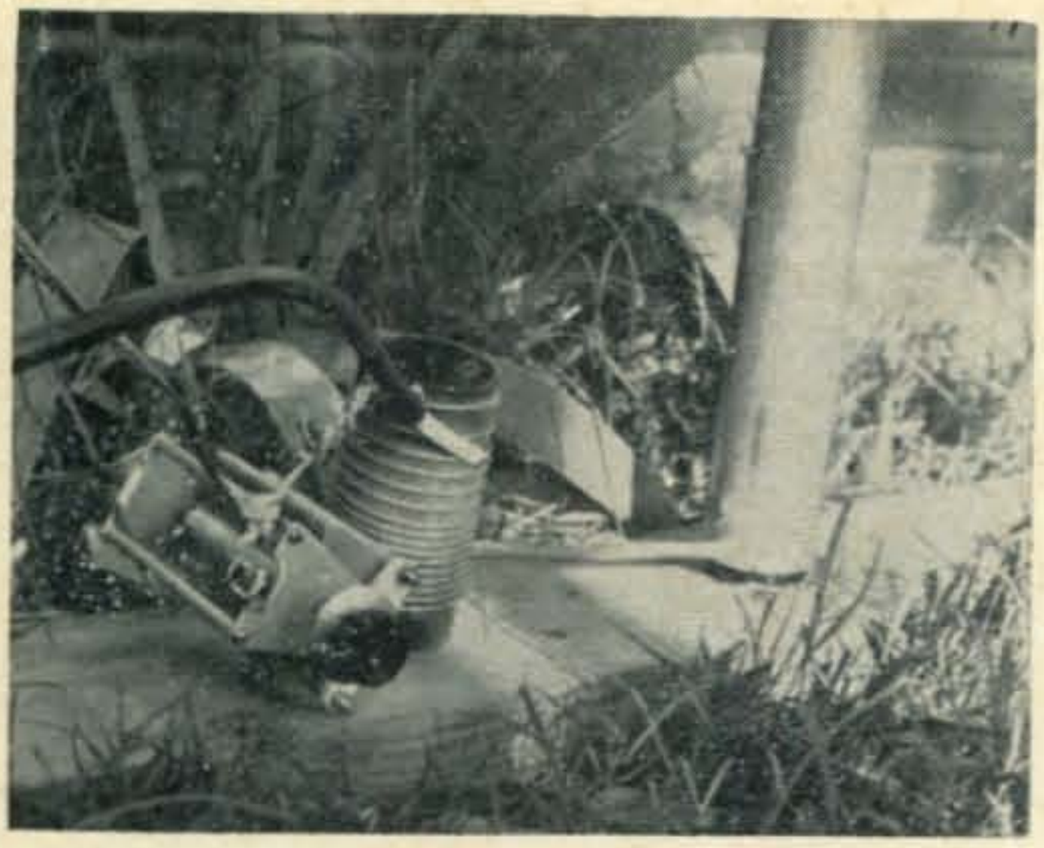


Fig. 1(A)—Test set-up used to select the proper tap position on the coil for 52 ohm coax. (B)—Basic construction of a 40 meter half wave vertical antenna. For 7.2 mc the length is 64' 2" ($\lambda/2 = 462/f_{mc}$).



View of the temporary lashup used to match the 40 meter vertical to a 52 ohm coaxial line. The assembly was rebuilt in a plastic refrigerator container for waterproofing. For 75 meter operation the antenna can be fed directly by coax.

at the end of a ½ wave antenna is approximately 2500 ohms. The parallel tuned circuit meets this requirement and allowed us to tap up on the coil to find a 52 ohm matching point for a low v.s.w.r. For 75 meters no tuned circuit is used but a ground system will be needed. Better still, use quarter wave radials extending out from the base. This can be fed directly by 52 ohm coaxial cable. The quarter wave radials for 75 meter operation will also improve the half wave forty meter antenna as it offers an established ground.

Guy wire became a problem. We felt that few were needed since the antenna was supported at the house and didn't offer, in itself, much of a wind catcher nor was it supporting anything. Wire guides are OK if you break them up with insulators every few feet. We decided on using rather heavy nylon fishing net cord. This was not too expensive, 500 feet for $2.00, and would eliminate the insulating problem.

For the matching coil about anything that will hit the frequency, 7.2 mc, and handle the power will do. We used a 250 mmf variable capacitor from the junk box and an old coil form. A 250 mmf variable and a 3" length of Air Dux #2004 (2½" dia., 4 t.p.i., 5 microhenries) will do very nicely. You can use a neon bulb to resonant this tank if a grid dip meter is not available. This assembly was later placed in a plastic refrigerator box to seal it from moisture.

Tune-up

For test purposes and to allow us to try our set-up we stood the antenna on a board, insulating the bottom with a power company standoff. This standoff had a hole in it, and the mast has a hole in it too. By placing a bolt or nail through the mast hole, with it down over the insulator, you have a nice seat for the antenna. Using a step ladder and adjusting the last two sections, we were able to set the mast to our selected frequency of 7.25 mc.

Utilizing an antenna scope and grid dip meter[1] (fig. 1(A)) we started up from the bottom of the coil until a 52 ohm point was found. If the grid dip meter and antenna scope are not obtainable, these measurements can be made with a standing wave meter which most hams have or can borow for the short time needed. The idea here is to feed 7.2 mc at low power, into the antenna. Then find the lowest v.s.w.r. by tapping the coil and adjusting the vertical section. Repeat the procedure until the v.s.w.r. is brought down to 1:1.

Results

On the air tests with the antenna has generated lots of excitement. First off, everyone just doesn't have a half wave job, and the result proved that the antenna was performing. On seventy five the antenna does a terrific job of working mobiles in the vicinity. Our cost was less than 20 dollars for our antenna and even if every part has to be purchased, the price shouldn't run over $25.00. ■

[1]Novice, *CQ* March 1960, p. 70.
Geiser, D. T. "The Instrument Deluxe," *CQ*, October 1962, p. 47.

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