# 80-meter antenna

## for a small lot

If you live in a stucco house on a small city lot, here's how to install an 80-meter antenna

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**Housing tracts** with small, uniform, close-spaced lots exist throughout the United States. In California the typical house on such a lot uses stucco construction. This is fine for the climate, but the galvanized-steel wire mesh used to support the stucco plaster is usually well grounded at each electrical outlet to the ac ground as well as to the cold-water pipe. Since this conductive, well grounded, two story, "shield can" rests approximately in the middle of the lot, it represents a non-ideal support for an amateur antenna; particularly a long, low-frequency antenna.

Faced with these facts, I tried to build an 80-meter antenna that would fit on the 60- by 100-foot lot, require no towers, be unobtrusive and be broadband enough for reasonable swr over the CW as well as phone portions of the band. I tried several configurations from U, L and V, ending up with the final Z shape shown in **fig. 1.** The desired broadband characteristics, in all cases, were dependent upon the "double bazooka" concept which combines the characteristics of a resonant coaxial length with a radiating dipole.[1]

Because of the odd shape due to the lot size restrictions and the influence of the stucco-house "shield can" I found little correlation between published theory and my experimental measurements. I proceeded on a cut-try-measure-cut-try-etc. basis until the trends yielded a reasonable antenna.

The physical layout of the antenna, house and lot is shown in **fig. 1.** The coaxial center section of the antenna runs along the peak of the roof and then down the roof lines toward the two supporting

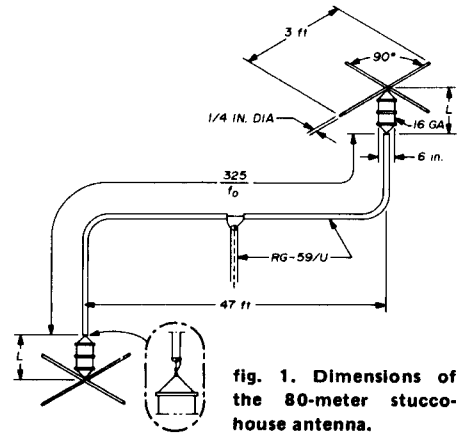


**fig. 1. Dimensions of the 80-meter stucco-house antenna.**

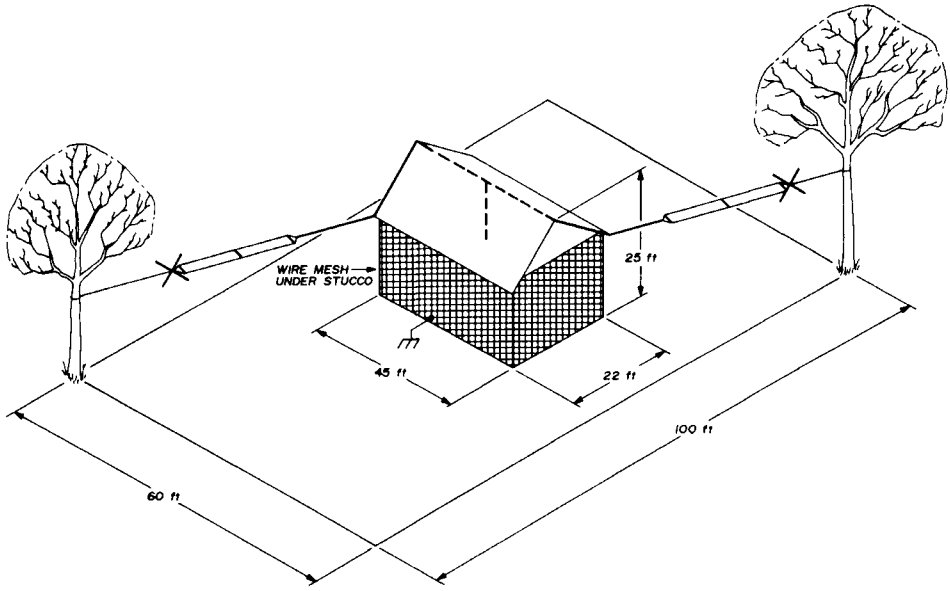


**fig. 2. Installation of the 80-meter antenna.**

trees. The coax feedline runs down vertically through the house to the transmitter. At the ends of the coaxial section are sections of open-wire transmission line with capacitance hats. The hats are made of two ¼-inch diameter, three-feet long, crossed aluminum rods. The dimensions of the antenna are shown in **fig. 2.**

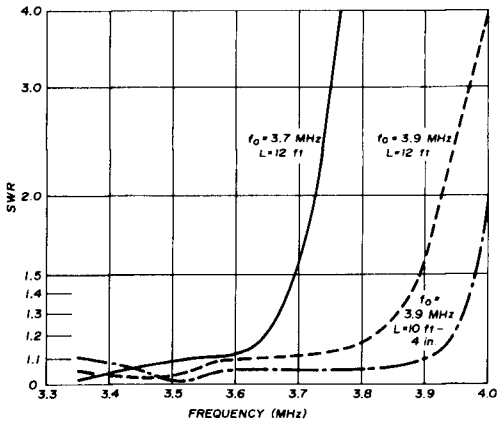


**fig. 3. Standing-wave ratio vs frequency for different antenna lengths. The length of the open-wire sections at each end of the antenna is given by L; $f_o$ is the design frequency in MHz where the length of the center section (in feet) is given by $325/f_o$.**

**Fig. 3** shows the measured swr vs frequency for several versions of this antenna. It can be seen that the influence of the Z-shape and the stucco house have drastically changed performance from that predicted in reference 1 for an isolated dipole. However, by trial and error the final geometry performs quite well over a large portion of the 80-meter band. Signal reports have been good, and the antenna seems to exhibit dipole-type directivity if the transmitting axis is assumed to be in a line with the antenna end points.

The rf voltage at the tips of the capacitance hats is very high so they should be placed well away from leaves, branches and people.

I hope that other amateurs who are restricted to life on similar house lots will be able to use this antenna configuration on 80 meters. Perhaps a similar arrangement could be developed for 160 meters.

## reference

1. D. DeMaw, W1CER, *The Radio Amateur's Handbook,* 48th edition, A.R.R.L., Newington, Connecticut, 1971, page 368.

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