A Gentleman's Antenna

The solution to an age-old problem: How do you fit a 160m wire onto a 40m lot?

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Only a few years ago, interest in the 160-meter band had lagged to almost nothing. The reason was simple: We as hams had become appliance operators and, until only recently, our appliances did not operate on 160. Well, all that's changed now.

Just browse through this magazine and look at the ads for new all-solid-state HF transceivers. With few exceptions, all operate on the Top Band. Now that the capabilities are there for 160, can most of us operate there? A resounding NO!

The big limiting factor for successful operation on 160 meters is the size of antennas needed. There are two basic antennas that see use on 160: the vertical and the dipole (or its cousin the vee).

Antennas

Verticals are basically low-angle radiators—very good for DX but not so good for local (under 500 miles) contacts. Verticals also require extensive ground work. This means much digging and laying of radials, with the end result supposedly a "perfect rf ground." It is a lot of work that can involve thousands of feet of wire for the radials and an equal amount of digging. Then there is the reseeding of the damaged lawn, to say nothing of what the XYL has been saying about your efforts. I won't even mention those quiet whispers among the neighbors.

There is an easier way: a dipole antenna. It is a wire antenna, as I am sure you all know, requiring only a feedline and a place between supports to hold it up in the air. No ground radials! Of course you do need 246 feet between the supports. That 246 feet is a long way—in fact, so long that most suburban antenna farms (house lots) cannot hold it. You could ask your neighbor if he would mind if you hooked part of your antenna into one of his trees. You know your neighbor...the one that owns the new TV you tear up on 20 meters during "Monday Night Football."

If you're like me, you don't want to owe your neighbor anything. I'll do it myself, thank you. So now what do you do? Build a reduced-size dipole. It's a good idea, you say, but you don't want to do all the math, right? OK, read on—I've done it for you.

The Short Answer

A shortened dipole is inductance loaded. This inductance must be placed between parts A and B of each dipole element (see Fig. 1). The inductance and element lengths vary depending upon the total length of the antenna used.

Measure between the two supports you plan to use (or measure the height of the single support you plan to use in the case of an inverted vee). Remember that the larger (closer to full size) the antenna is, the more efficient it will be (see Table 1). Table 1 is based upon computer design information for 1.9 MHz.

Coil Construction

In Table 1 the number of

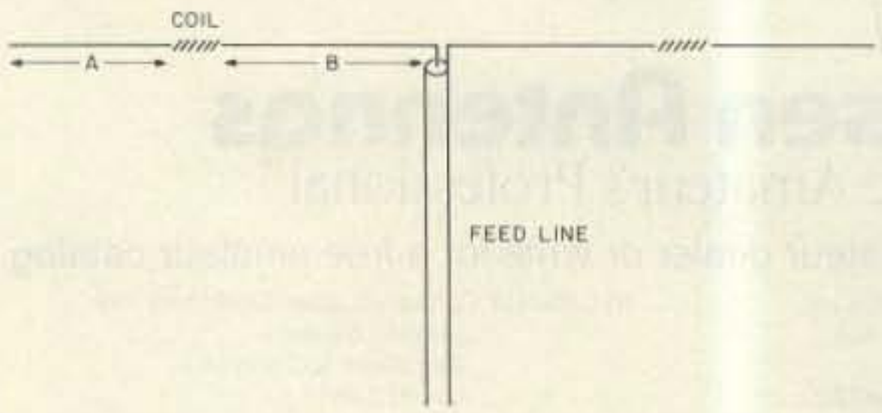

Fig. 1. An inductance-loaded shortened dipole.

Overall Length (ft.)	Element A Length	Number Of Coil Turns	Element B Length
246.3	full-size antenna		
221.3	66.5	10	44.3
197.1	59.1	20	39.4
172.4	51.7	33	34.5
147.8	44.3	48	29.6
123.2	36.9	65	24.6
98.5	29.6	86	19.7

Table 1.

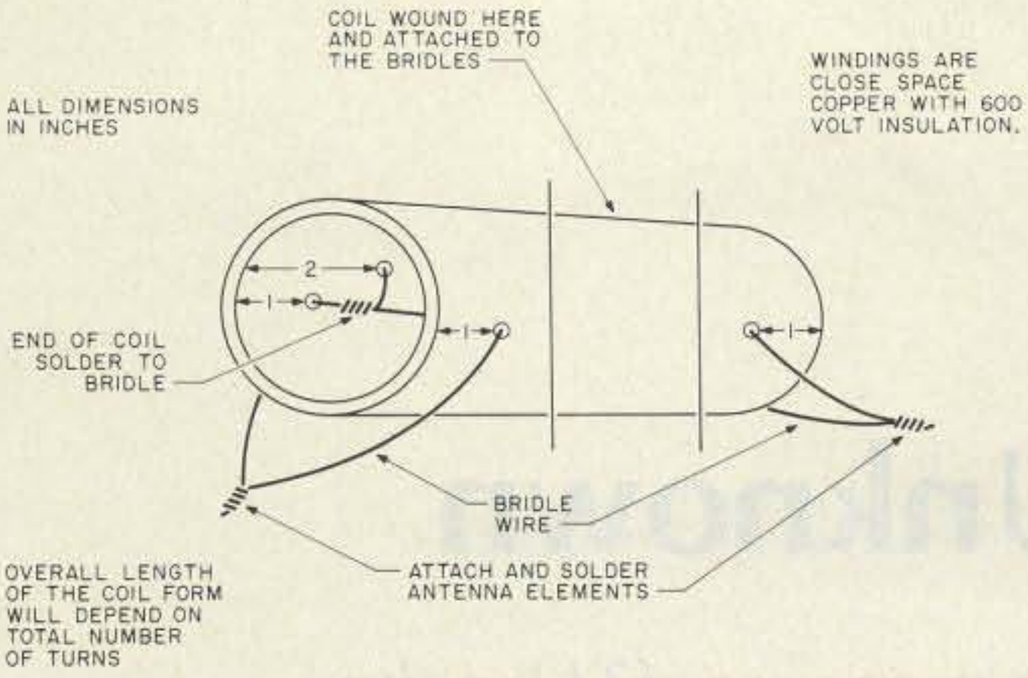

Fig. 2. Loading-coil detail.

turns for the coil is given. The coil is made by winding #12 insulated house wire on a form made of 2½"-outside-diameter plastic pipe. I use 2"-inside-diameter Amoco rigid PVC conduit. The wire is close wound, with the plastic insulation acting as the spacer. The result is a coil with a pitch of 8 TPI (see Fig. 2).

Installation

The antenna is installed exactly as any other dipole or inverted vee. I do not recommend the use of a balun but suggest the use of a good center insulator and RG-8 coax (you will probably be running an amplifier someday). The antenna is tuned by the usual method of an swr bridge and trimming or adding to the ends of the elements. To raise the resonant frequency, shorten the antenna. To lower it, lengthen the antenna.■