ANTENNAS

For the VHF Bands

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Simple Tubular Designs for 50, 144 and 220-Megacycle Allocations These Basic Antennas are of Particular Interest to the New Ham

THE NEW VHF bands of 50-54 mc, 144-148 mc, and 220-225 mc do not necessarily require any radical departure in antenna design from that which has been previously used for VHF frequencies. The antennas to be described are the simpler, non-directional arrangements which are not difficult to construct, and are time-tested and proved. Open-wire feed and *Q*-section matching are employed. Arrays, matching stubs, and concentric cable feed are subjects worthy of separate and individual consideration and therefore are not included here.

Tube Construction

These antennas are to be built from tubing (copper, brass or aluminum)—not wire. Wire antennas have a high Q, therefore peak sharply at the resonant frequency. For efficiency over the 4 to 5-mc width of the VHF bands, tubing of ½ to 1-inch diameter should be used. Connections should preferably be soldered. As a second choice the ends of the tubes may be flattened, drilled, and bolted together. Support the tubes with suitable stand-off insulators, and run the feeders at a right angle to the antenna for as great a distance as possible.

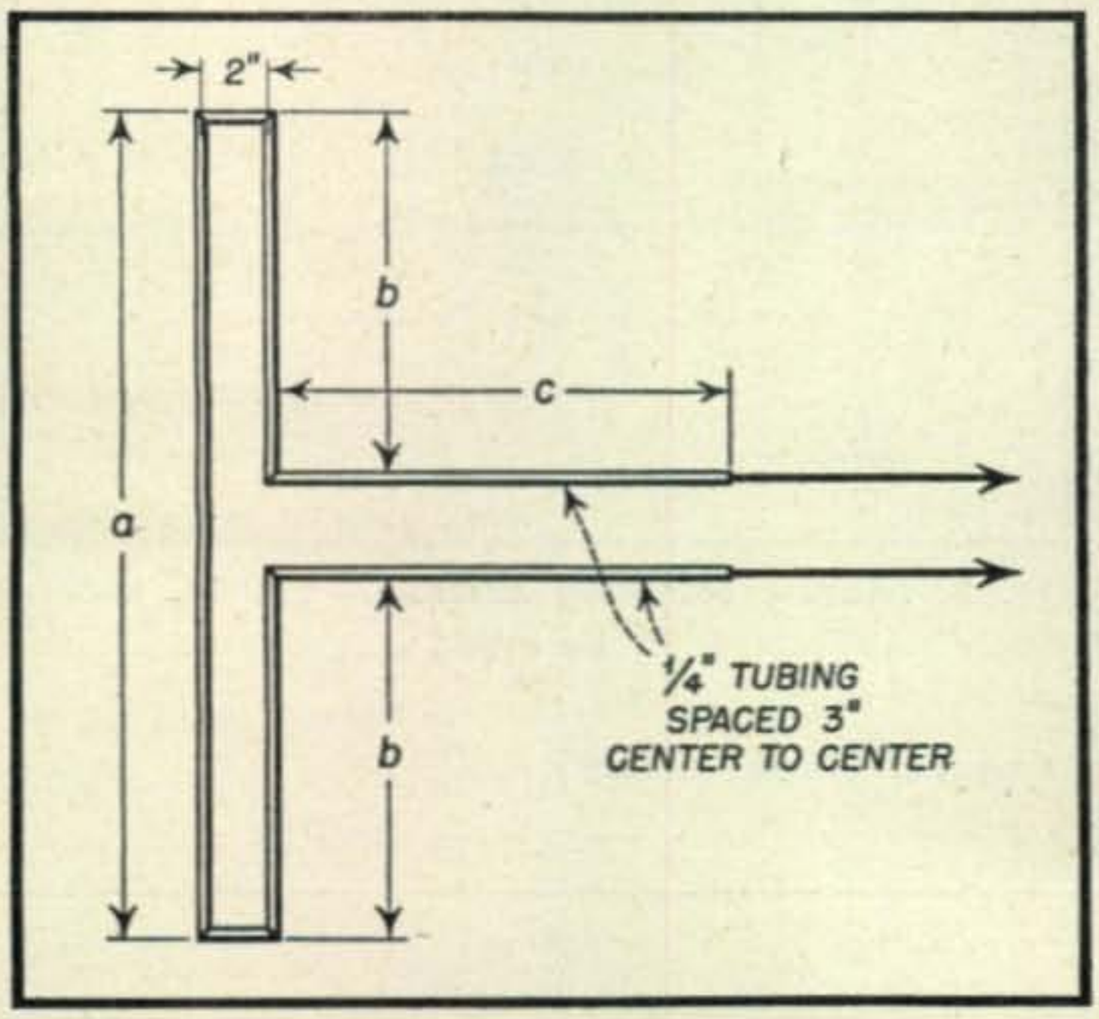

Fig. 1. The folded doublet. All elements are of tubing

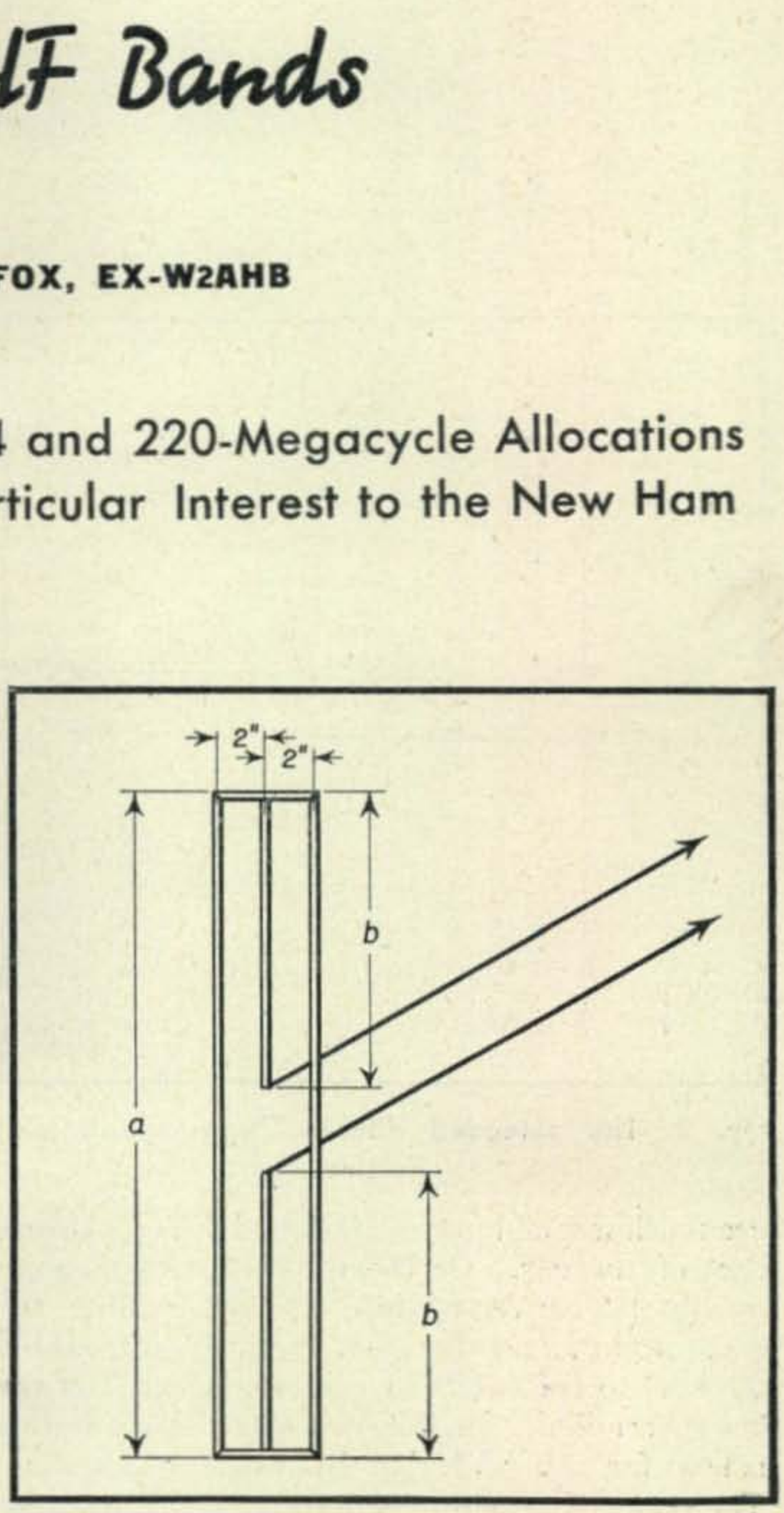

Fig. 2. Another section added to Fig. 1. raises the impedance to approximately 500 ohms

In *Fig. 1* we have the folded doublet. As the

impedance at the center is about 300 ohms, this antenna may be fed directly with a pair of #8 wires spaced ¾ inch; but for a feeder of smaller wire size the *Q*—section should be used. Add another section as shown in *Fig. 2* and the antenna impedance will then be a very close match for a 500 ohm line, so that no *Q*-section is required.

The extended double Zepp, *Fig. 3*, is always an excellent performer and very easy to build. Next, in *Fig. 4*, is the familiar *J*—a half-wave vertical with a quarter-wave matching stub on the bottom end. The *e* and one of the *c* portions are, of course, a single piece of tubing. As the bottom of the *J* is at ground potential, in mobile

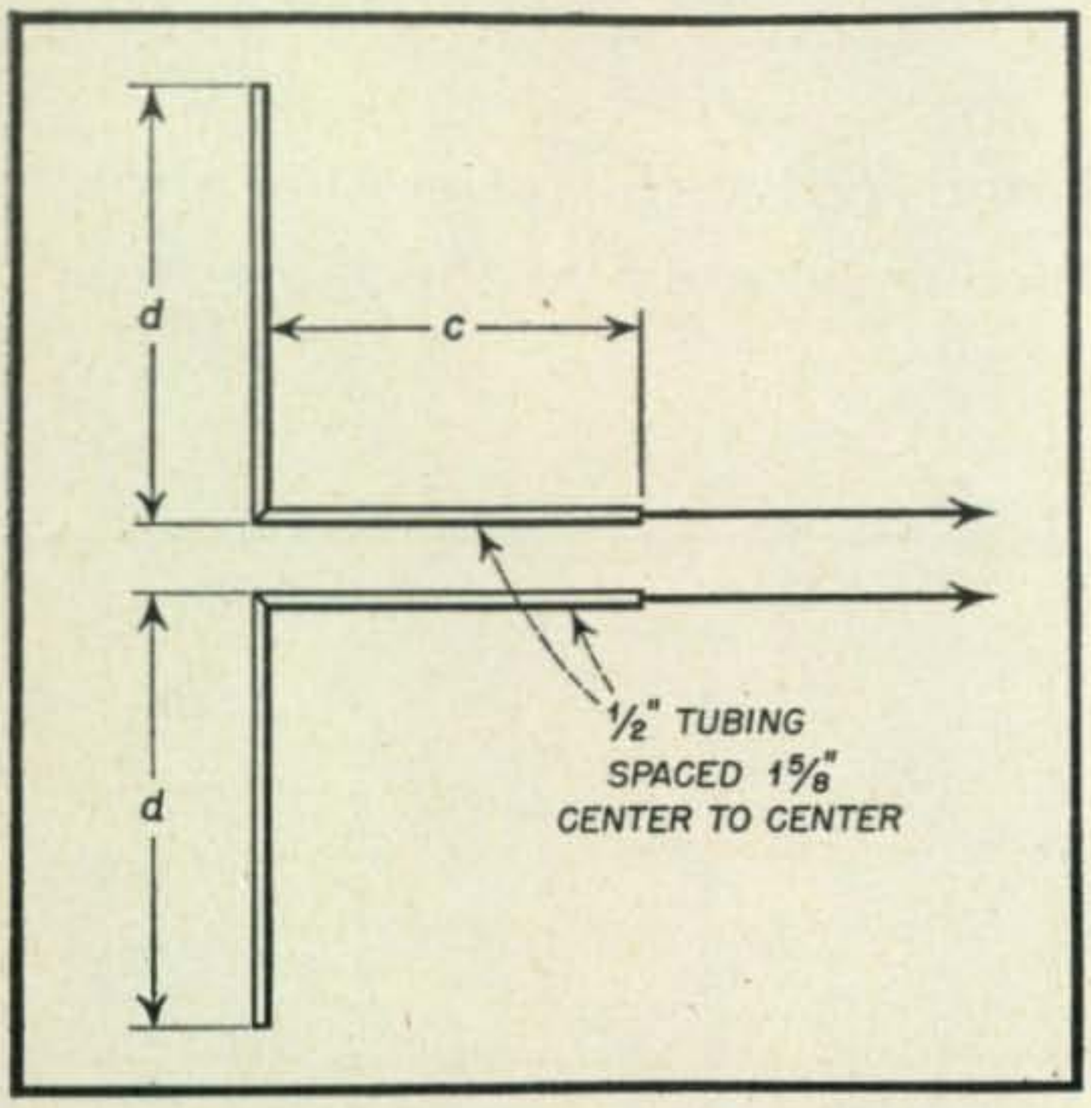

Fig. 3. The extended double Zepp—simple and effective

use this lower end may be fastened directly to any part of the car. Or the car BC antenna may readily be converted into a *J* by adding the bottom piece and the short vertical, and leaving the lead to the car BC receiver connected at the lower terminal. In this way the same antenna is used for either VHF or BC without switching. The point of attachment for the feeder must be determined experimentally for the best results.

Mobile Antenna

The half-wave antenna of *Fig. 5* is especially designed for mobile operation. The capacitor setting should be that which least detunes the transmitter when the line is connected at the

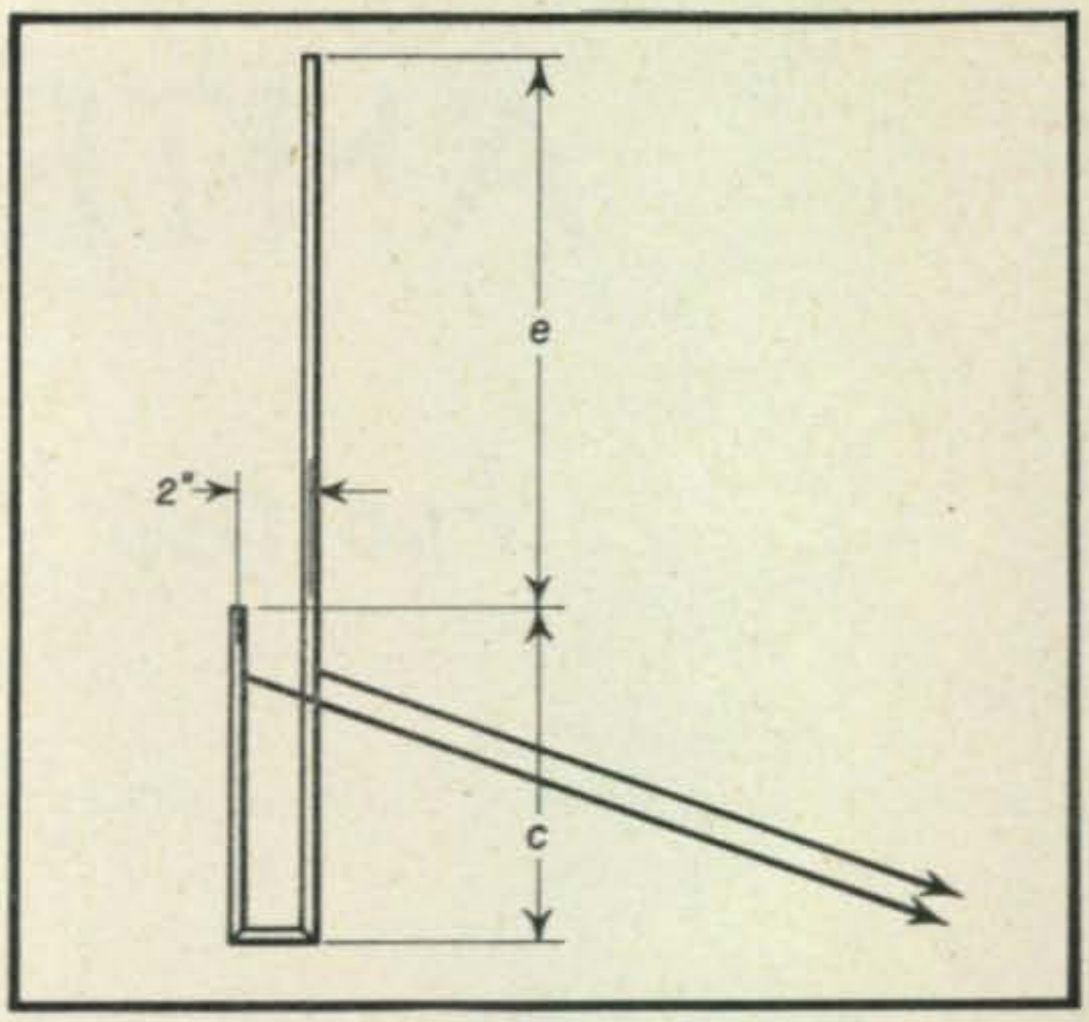

Fig. 4. The "J"—a half-wave vertical with a quarter-wave matching stub

transmitter end. This capacitor is not used to adjust transmitter loading, as this adjustment should be made only by varying the position of the coupling coil.

Feeders are #14 bare copper wire, spaced 2 inches. All other dimensions shown in the diagrams are given in the table below.

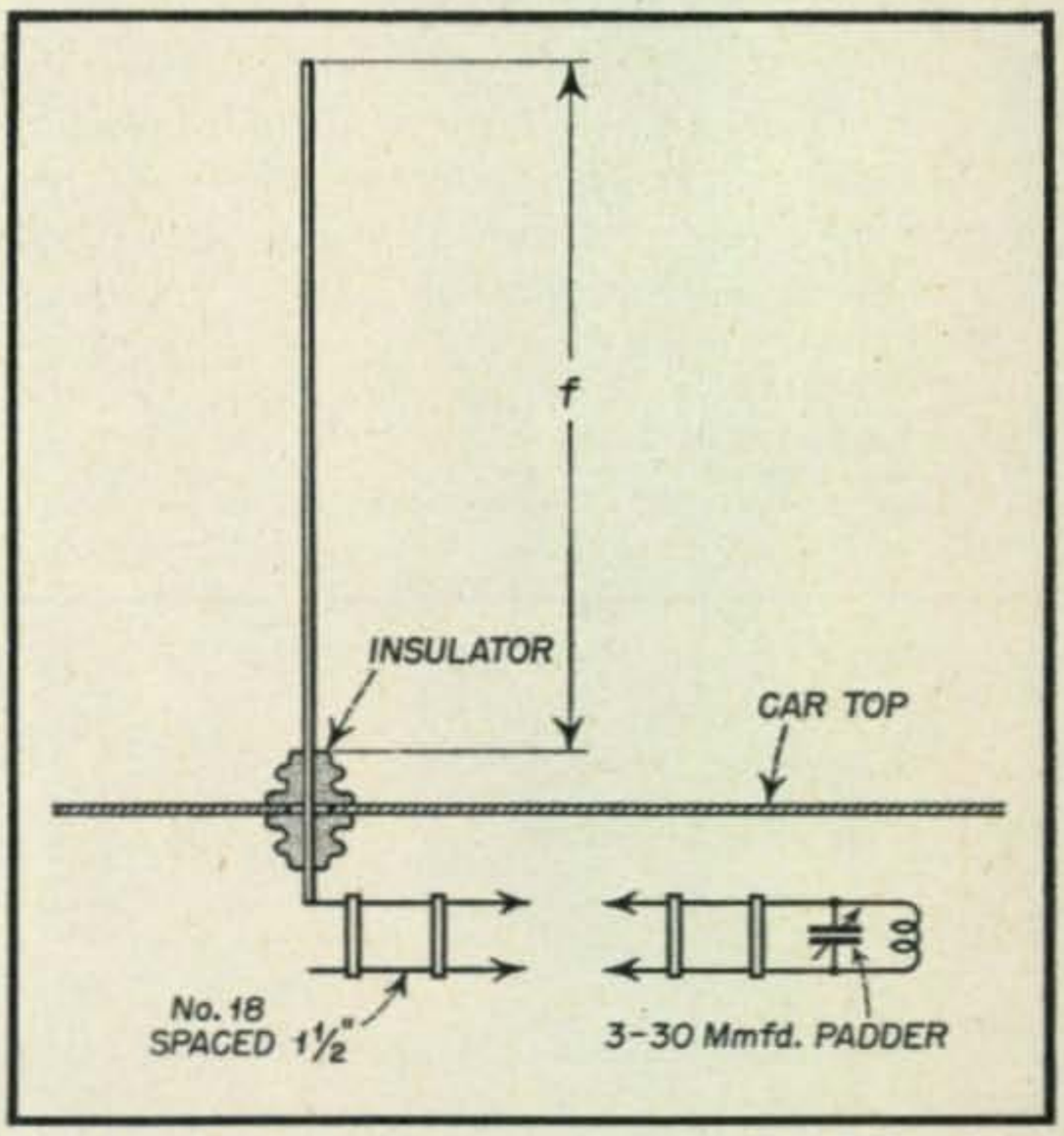

Fig. 5. Mobile half-wave antenna. The BC rod can be used

TABLE OF ANTENNA ELEMENT DIMENSIONS

mc	*a*	*b*	*c*	*d*	*e*	*f*
52	110½"	54¼"	55½"	136¼"	106¼"	——
146	39¼"	18 5/8"	19¾"	48½"	38"	35"
222½	25 7/8"	11 15/16"	12 31/32"	31 29/32"	24 29/32"	23½"