two separate single-ended capacitors will be satisfactory. As described earlier, they should be connected so that both frames go to corresponding parts of the circuit — i.e., either to the coil or to the line — for series tuning, and when used in parallel for parallel tuning should be connected frame-to-stator.

A coupler designed and adjusted so that the connecting link acts as a matched transmission line may be placed in any convenient location. Some amateurs prefer to install the coupler at the point where the main transmission line enters the station. This helps maintain a tidy station layout when an air-insulated parallel-conductor transmission line is used. With solid-dielectric lines, which lend themselves well to neat installation indoors, it is probably more desirable to install the coupler where it can be reached easily for adjustment and band-changing.

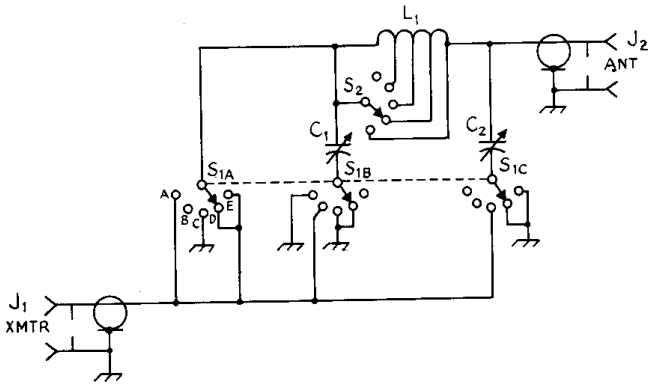

Fig. 13-13—Circuit diagram of an antenna coupler for "random" antennas. All contacts of S_2 are not shown.

C_1, C_2—150 pf. See text for spacing.
J_1, J_2—Coaxial receptacles (SO-239).
L_1—20 turns No. 12 bare, 2½ inch diam., 6 t.p.i. (B&W 3905-1). Tapped every other turn.
S_1—Three-pole 5-position ceramic rotary switch.
S_2—Single-pole 11-position ceramic rotary switch.

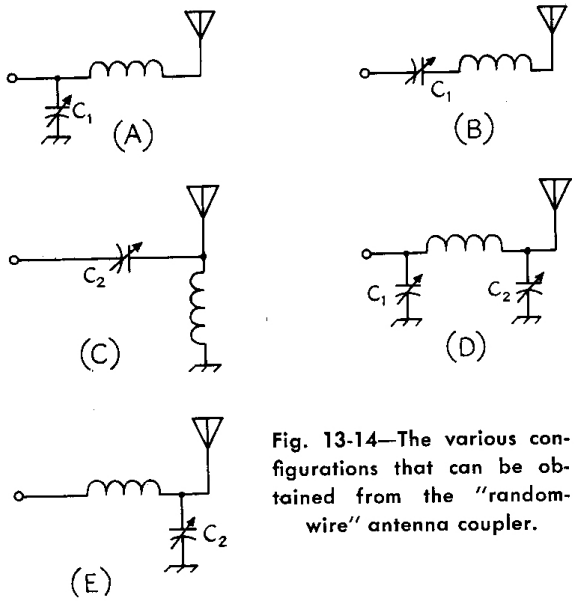

Fig. 13-14—The various configurations that can be obtained from the "random-wire" antenna coupler.

MATCHING TO "RANDOM" ANTENNAS

In many cases it is impractical or impossible to install a conventional antenna complete with transmission line. Under these conditions, the only solution may be to string a wire to an existing support or between two supports and run one end to the transmitter. Such a "random" antenna will not couple conveniently to the low-impedance output of most transmitters unless its length happens to be an odd multiple of a quarter wavelength. In cases where a random antenna must be used, the antenna-coupler circuit of Fig. 13-13 provides a simple solution. Although specific values are given for C_1, C_2 and L_1, they are not critical. C_1 and C_2 should be at least 150 pf. The spacing of C_1 and C_2 should be 0.025 inch for transmitter inputs of 100 watts or less. L_1 may be a convenient length of any of the two- to three-inch diameter air inductors, or it can be a homemade coil on a ceramic form. It should be tapped every two or three turns. The tuner may be built in an open "breadboard" style, or it can be enclosed in a metal cabinet or chassis. If it is built breadboard, it may be more convenient to use a small clip instead of S_2 to vary the inductance of L_1. An elaborate version can be made with a built-in Monimatch and output indicator.

The several configurations that can be obtained from the coupler are shown in Fig. 13-14. The letters correspond to those on the switch S_1.

When first using this tuner with an antenna, try various positions of C_1, C_2, S_1 and S_2 in order to find the point at which maximum output is obtained (maintaining a constant transmitter input). When the correct settings have been found for each frequency band, and these settings have been noted for future reference, it is an easy matter to hop from band to band. With certain settings and configurations it will be pos-

Fig. 13-15—An example of how the antenna coupler can be built. In this case the components are installed in a 10 × 17 × 3-inch aluminum chassis that serves as the support for the transmitter. An r.f. ammeter (right) is used as an output indicator. (W4UWA/DL4, *QST*, November, 1958).