Parts B and C of Fig 10-17 show the radiation patterns resulting from the insertion of a single stub (or coil) in one of the bottom corners of the delta loop. The insertion of the single loading device has broken the symmetry in the loop, and the bottom wire now radiates as well, upsetting the pattern of the loop.

This can be avoided by using two loading coils or stubs, located symmetrically about the center of the baseline. The example in **Fig 10-18A** shows two stubs, one located in each bottom corner of the loop. Each loading device has an inductive reactance of 142 Ω. For 3.5 MHz this is:

$$\frac{142}{2\pi \times 3.5} = 6.46\,\mu\text{H}$$

A 450-Ω short circuited line is 3.96 meters long (see calculation method above). The corresponding radiation patterns in Fig 10-18 are now fully symmetrical, and the annoying high-angle radiation is totally gone. The 100-kHz SWR bandwidth is 1.45:1. The 2:1 SWR bandwidth is 170 kHz.

Fig 10-19 shows the practical arrangement that can be used for installing the switchable stubs at the two delta-loop bottom corners. A small plastic box is mounted on a piece of epoxy printed-circuit-board material that is also part of the guying system. In the high-frequency position the stub should be completely isolated from the loop. Use a good-quality open-wire line and DPDT relay with ceramic insulation. The stub can be attached to the guy lines, which must be made of insulating material. If at all possible, make a high-Q coil, and replace the loading stub with the coil!

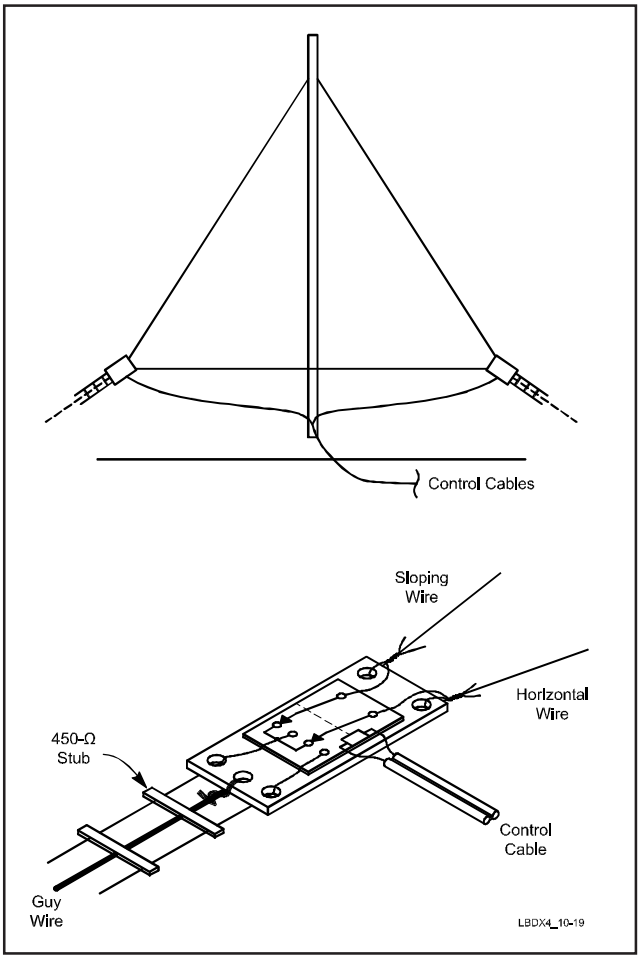

Fig 10-19—Small plastic boxes, mounted on a piece of glass-epoxy board, are mounted at both bottom corners of the loop, and house DPDT relays for switching the stubs in and out of the circuit. The stubs can be routed along the guy lines (guy lines must be made of insulating material). The control-voltage lines for the relays can be run to a post at the center of the baseline and from there to the shack. Do not install the control lines parallel to the stubs.

3.1.2. Capacitive loading

You can also use capacitive loading in the same way that we employ capacitive loading on a vertical. Capacitive loading is to be preferred over inductive loading because it is essentially lossless. Capacitive loading has the most effect when applied at a voltage antinode (also called a voltage point).

This capacitive loading is much easier to install than the inductive loading, and requires only a single-pole (high-voltage!) relay to switch the capacitance wires in or out of the circuit. *Keep the ends of the wires out of reach of people and animals, as extremely high voltage is present.*

Fig 10-20 shows different possibilities for capacitive

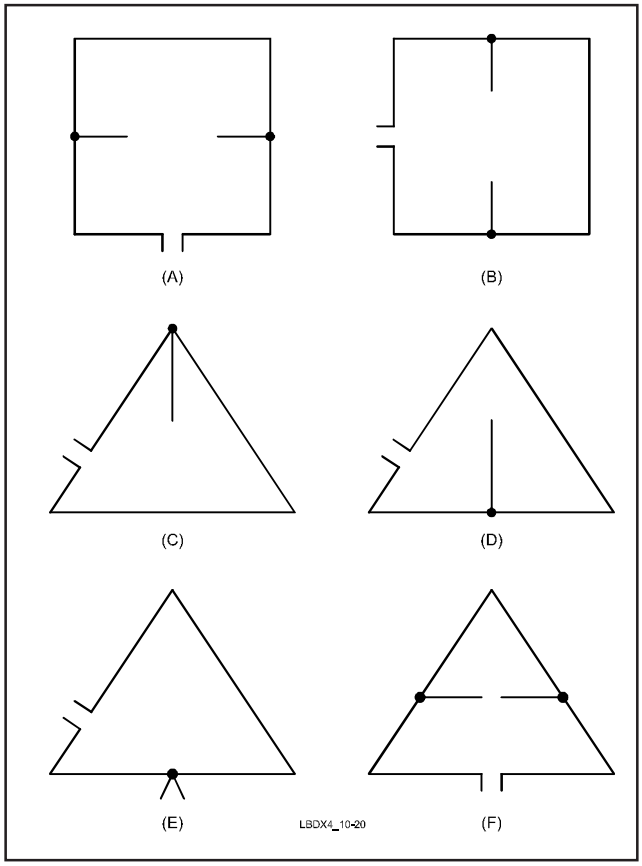

Fig 10-20—Various loop configurations and possible capacitive loading alternatives. Capacitive loading must be applied at the voltage maximum points of the loops to have maximum effectiveness. The loading wires carry very high voltages, and good insulators should be used in their insulation.