

ELECTRONIC

You don't need a gold-leaf electroscope to carry this simple vacuum-tube unit works just as well,

MOST DEMONSTRATIONS or experiments dealing with static electricity require an electroscope to indicate the presence of small amounts of positive or negative charge. In laboratories, gold-leaf electroscopes are commonly used, but these may be too delicate and costly for the average home experimenter. The electronic electroscope described here, however, is not only rugged and inexpensive (under \$7.00), but is as sensitive as a gold-leaf electroscope. Needing only a few parts, it can be built in about an hour.

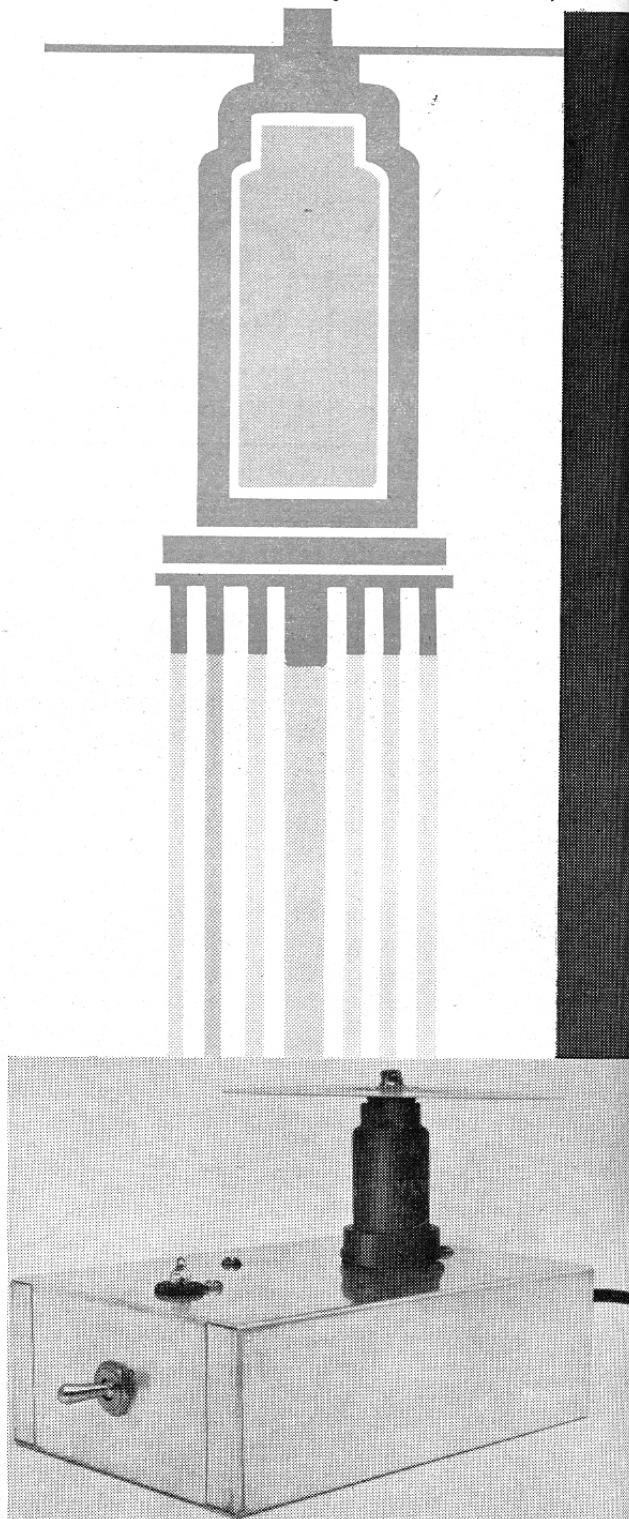
The electroscope fits easily on a standard 2" x 6" x 4" chassis. The detector disc, a 5"-diameter copper or steel plate with a $\frac{3}{8}$ " hole drilled through its center, fits over the grid cap of a 6J7 tube (V1) and is soldered in place. Neon lamp *II* is held in a $\frac{3}{8}$ " rubber grommet mounted on the chassis.

The 6J7 is effectively connected as a triode and the neon lamp is placed in series with its plate lead. The tube's plate supply is unrectified a.c. taken from the high-voltage secondary of transformer *T1*, and the control grid is connected directly to the detector disc.

When the unit is turned on, a certain amount of plate current will flow and *II* will light. If a positively charged object is brought near the disc, the grid of the tube becomes positive and the plate current increases—increasing the brightness of *II*. Conversely, a negatively charged object will cause *II* to dim or go out because it charges the grid negatively, reducing or cutting off the plate current.

To try out the electroscope, use a glass rod which has been rubbed with silk to supply the positive charge. A piece of rubber which has been rubbed with wool or fur makes a good negatively charged object. You'll find that the electroscope will respond to the presence of a charge placed several feet from the pickup disc.

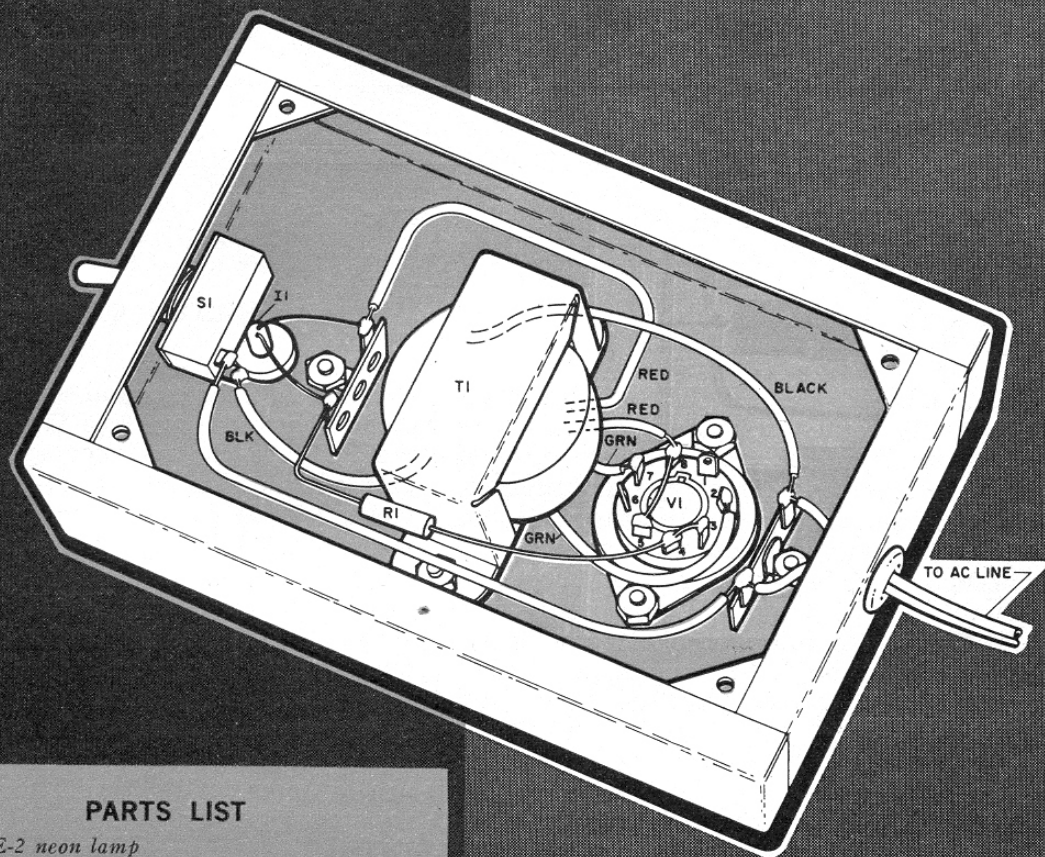
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ELECTROSCOPE

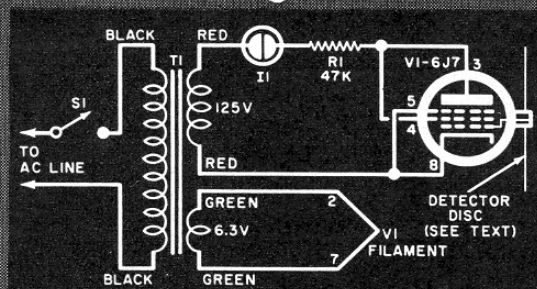
out those static electricity experiments or demonstrations; costs less than \$7.00 to build.

By RONALD WILENSKY



PARTS LIST

- I1—NE-2 neon lamp
- R1—47,000-ohm, 1-watt resistor
- S1—S.p.s.t. toggle switch
- T1—Power transformer; primary, 117 volts; secondaries, 125 volts @ 15 ma., 6.3 volts @ 0.6 amp. (Stancor PS-8415, Knight 61 G 410, or equivalent)
- V1—6J7 tube
- 1—2" x 6" x 4" chassis (Bud AC-431 or equivalent)
- Misc.—Copper or steel plate for detector disc, octal socket, grommets, terminal strips



Completed unit (left) uses few parts, yet detects the presence of a charge several feet away.

