

# Horizontal Defect Detector for TV Servicing



By WILLIAM B. COOMES

**THE SYMPTOMS:** sound but no picture—a black screen.

**Diagnosis:** could be many things but to start you listen for that 15,750-cps whistle that comes from the set's high-voltage section. If you have good ears and hear it you know that section is working.

But not everyone can hear that frequency. (Of course you could disconnect the high-voltage lead to the pix tube and try to draw an arc to the chassis.)

A safer and faster way to find out whether the high-voltage section is working is with our Horizontal Defect Detector. It's a field-strength meter tuned to 15,750 cps. When brought near the set, or any component operating at that frequency, the meter shoots upscale.

**Construction.** First, wind coil L1 on the ferrite core removed from the loopstick antenna specified in the Parts List. The wire is No. 34 enameled. Tape the wire to one end of the rod leaving a 4-in. length for lead No. 1. Then tape the wire along the rod to within  $\frac{1}{8}$ -in. of the other end. Now wind 900 turns (don't worry about losing count of a few turns) in a single layer along the length of the rod ending about  $\frac{1}{4}$  in. from the other end. (If you get tired of counting, tape the wire, noting the number of turns to that point, and take a rest.) This portion of the coil should be wound smoothly and closely so it will fit in the space available. However, if you can't get 900 turns in the space, add the remaining turns to the next winding.

Pull out a 4-in. loop of wire for the tap (wire No. 2). Wrap electrical tape over the lower 2-in. of the coil then scramble wind 1,100 turns over the tape. Coat this portion of the coil with Q-dope or nail polish to hold the wire.

The coil is mounted in a  $\frac{5}{16}$ -in. dia. hole in the center of one end of the box,  $\frac{3}{8}$ -in. above the back. Variable capacitor C1 is mounted in the other end of the box. The meter requires a  $1\frac{1}{2}$ -in.-dia. hole in the top of the front panel and a  $\frac{1}{8}$ -in. hole at each corner of a  $1\text{-}9/32$ -in. square. The remaining parts (except for C2 are mounted on a  $1\frac{1}{8}$  x  $1\frac{3}{8}$  in. Piece of perforated board as shown in the pictorial and photo.

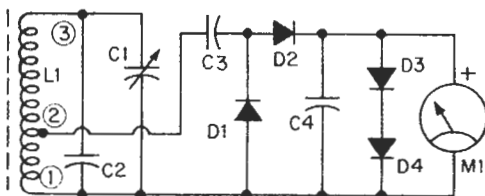
**Check-Out and Operation.** Hold the completed unit in front of an operating TV and tune C1 for maximum indication on M1. Mark the position of the knob at this point. Hold the detector in front of and close to the screen of an inoperative TV set. If M1 deflects, the high-voltage section is working.

## Horizontal Defect Detector for TV Servicing

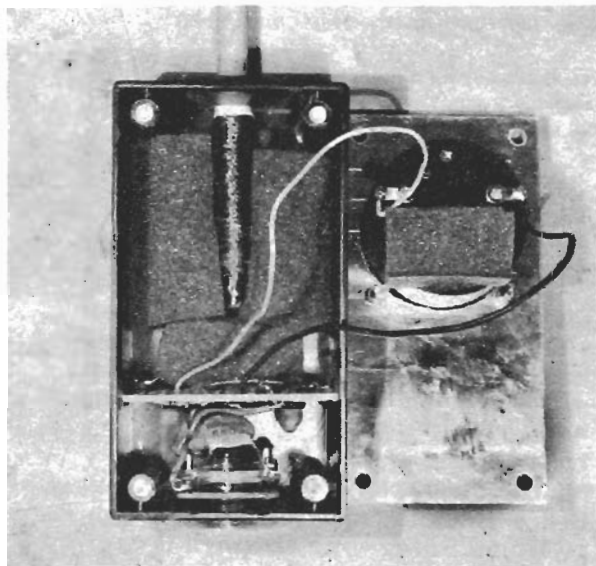
The reading should be about half-scale or higher.

After removing the back of the TV, the signal can be traced back through the high-voltage rectifier, the horizontal-output transformer (always be extremely careful when working around the high voltage section), the horizontal-output stage and the horizontal oscillator.

**How it Works.** Pickup probe L1, wound on a ferrite rod, is part of a tuned circuit whose other parts are C1 and C2. Capacitor C3 couples the signal to detector diodes D1 and D2. The detector circuit is connected to a tap on L1 to prevent the Q of the tuned circuit from being lowered. Meter M1 indicates the presence and strength of the signal. Diodes D3 and D4 provide overload protection for M1.

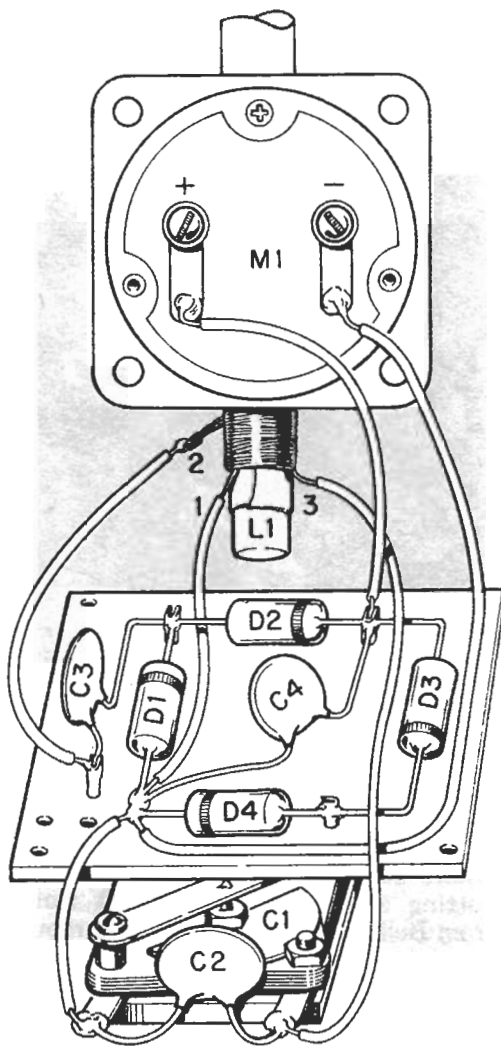


Detector schematic, above. In photo below, note 1,100-turn winding on L1 and vertically mounted board. Pieces of sponge rubber hold L1 in place.



### PARTS LIST

- C1—10-365  $\mu\text{f}$  miniature variable capacitor (Lafayette 99 E 62176)
- C2—680  $\mu\text{f}$  30 V or higher disc capacitor
- C3,C4—.001  $\mu\text{f}$ , 30 V or higher disc capacitor
- D1-D4—General-purpose germanium diode (Lafayette 19 E 15057. Pkg. of 10 for 79¢)
- L1—Pick-up coil: 2,000 turns No. 34 enameled wire wound on ferrite core from Lafayette 32 E 82027 loopstick antenna)
- M1—0-50  $\mu\text{a}$  DC microammeter
- Misc.—4 x 2 $\frac{1}{8}$  x 1 $\frac{1}{8}$ -in. Bakelite utility box with aluminum panel, perforated board



Lead 1 on L1 is start of winding, 2 is tap, 3 is end of winding. Corresponding numbers are on L1 in the schematic. Parts layout isn't critical.