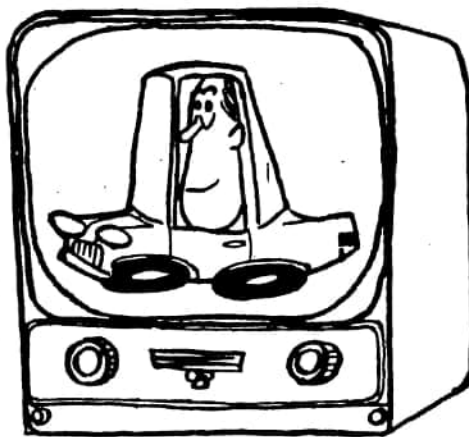


# TV Pattern Generator



By John Potter Shields

**You'll be able to set your TV height and linearity controls perfectly with this inexpensive gadget.**

**B**EEN seeing strange people in elongated cars with oval wheels on your TV screen? Those aren't outer-space critters. Your set's vertical height and linearity controls just need adjustment. Our simple, pocket-size TV Pattern Generator is perfect for the shape-up required. Total cost of parts is only about \$6.

One of the big advantages of using the patterner is that you won't have to guess about the size of people or objects during rapidly-changing scenes during a TV program. Best of all, you needn't wait up till the early hours for a standard test pattern to come on.

In addition, the patterner produces a tone-modulated RF signal which is useful in troubleshooting sound circuits in TV sets or FM tuners.

Using only two transistors, the circuit is powered by a 9-volt battery. Construction and use are simple and you don't have to make a direct connection to the antenna terminals on the TV set.

## Construction

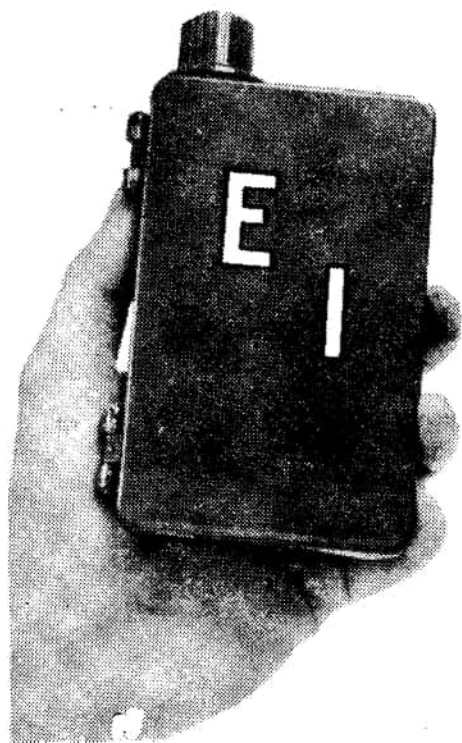
The author built his patterner on a piece of perforated phenolic board cut to about  $3\frac{1}{2} \times 1\frac{1}{2}$  inches. You may find construction easier with a larger board. Brass eyelets were used as tie points. Flea clips would work as well. Because of the high frequency at which the RF portion of circuit operates, point-to-point wiring as direct as possible is important.

The most critical component is coil L1. It has six turns of No. 18 solid, tinned, copper wire. The inside diameter is  $\frac{3}{8}$  inch and the length is  $\frac{7}{16}$  inch. Snip the ends short and solder directly to C3's lugs. C3 is mounted in a  $\frac{1}{4}$ -inch hole in the perforated board.

The patterner can be housed in a small plastic box. But if you choose a metal enclosure, be sure L1 is at least  $\frac{1}{2}$  inch away from the box.

## How to Use It

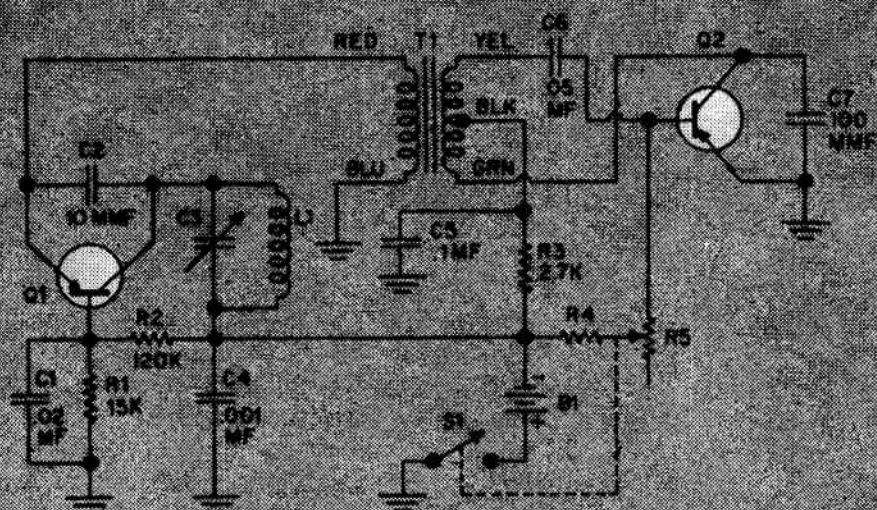
After you've soldered the last connection, check for wiring errors and shorts, and then turn on the



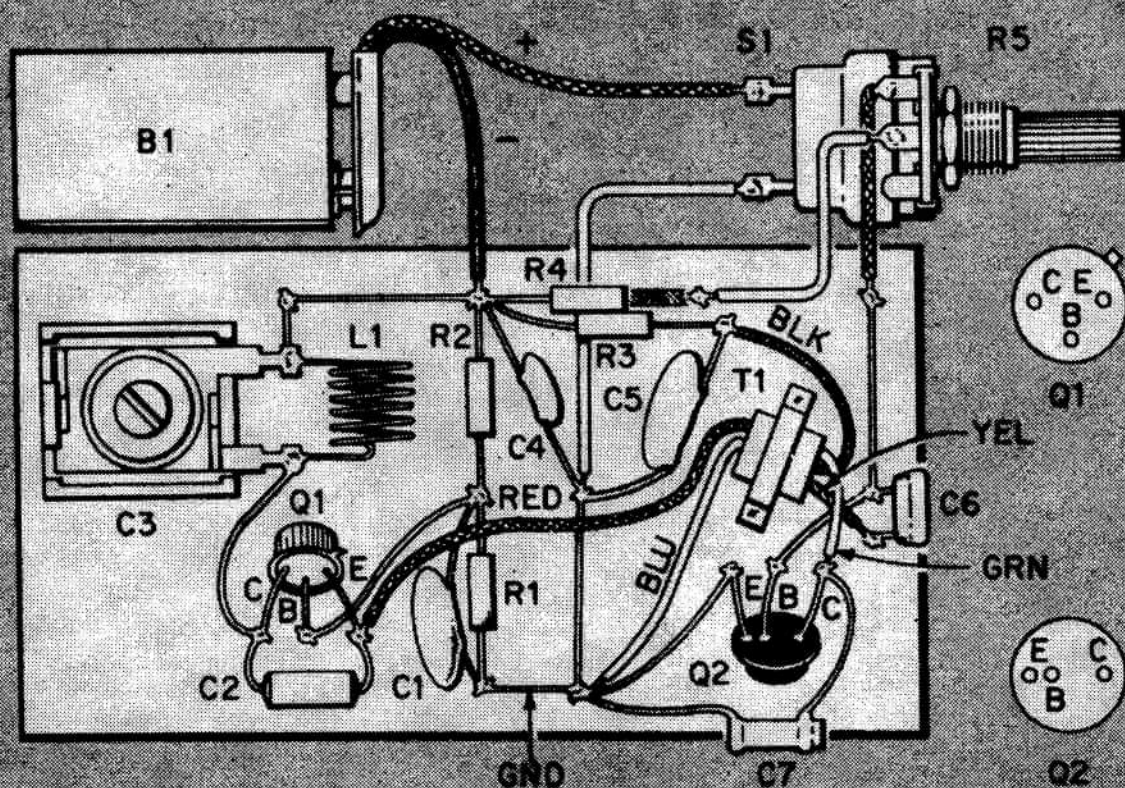
# PARTS LIST

Resistors: 1% var, 10%  
 R1—15,000 ohms  
 R2—15,000 ohms  
 R3—2,700 ohms  
 R4—15,000 ohms  
 R5—250,000-ohm, linear-taper potentiometer  
 Capacitors: Low-voltage disc ceramic unless otherwise noted  
 C1—33 mf  
 C2—15 mf  
 C3—15-100 mf, 100V  
 C4—100 mf  
 C5—100 mf  
 C6—100 mf  
 C7—100 mf

Q1—2N107 transistor (available for \$2.95 from  
 Sams Electronics Co., 384 Canal Street, New York 13,  
 N. Y.)  
 Q2—2N107 transistor  
 L1—Oscillator coil (See text)  
 T1—Transformer driver transformer: 10,000-ohm  
 primary, 2,000-ohm, center-tapped secondary  
 (Lafayette T8-48 or equiv.)  
 B1—9-volt battery  
 S1—SPST switch on R5



Porter's schematic.  
 If output doesn't fall  
 within channels 2 or  
 3, spread or compress  
 L1. Q2, the  
 AF pulse modulator,  
 is used as modified  
 blocking oscillator.



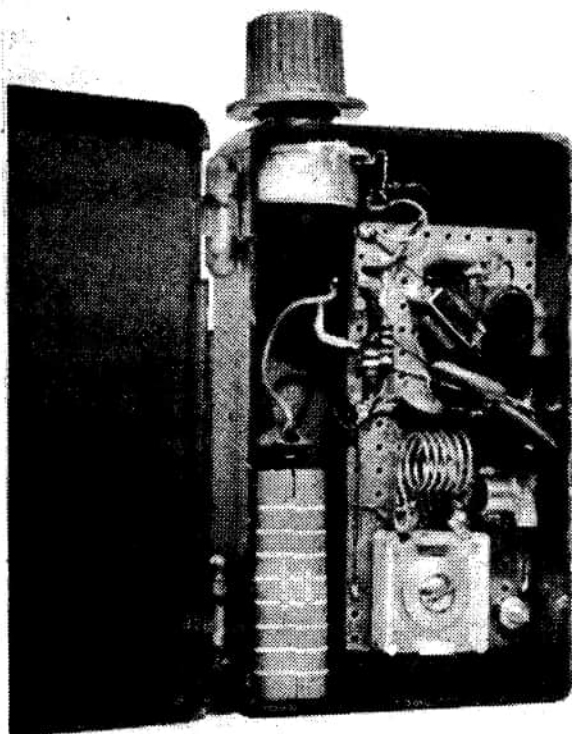
Keep RF-section wiring around Q1, L1 and C1 short. Bussing on C3 mounts through circuit board.

power. Tune your TV set to channel 2 or 3 and bring the patterner to within a foot or less of the antenna terminals. Adjust C3 until one or more horizontal bars appear on the screen. In the author's model this point was near maximum capacitance of C3 (when the screw was tight). Adjusting R5 changes the number of horizontal lines. Use whatever number you want as long as they clearly show up differences in bar spacing from top to bottom.

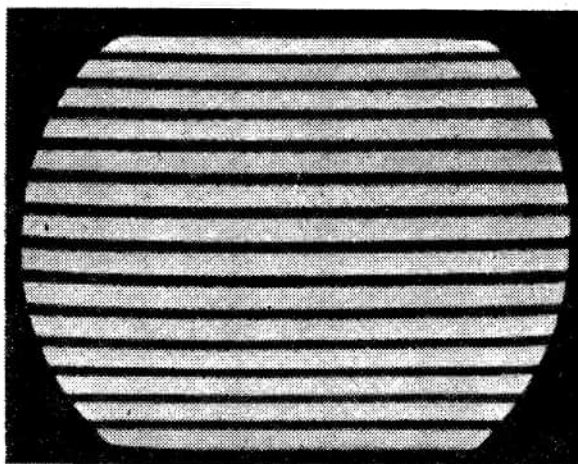
Now adjust the vertical height and linearity controls on your TV set until the spacing between bars on the top and bottom of the picture is the same and looks like our photo. Since the vertical height and linearity controls interact they must be adjusted together.

If you build the patterner in a metal box, make final tuning adjustments after mounting the chassis board in the case, or you may detune the RF oscillator.

C3 can be adjusted so one or more harmonics of the RF output will fall within the FM band. Set your FM receiver's dial at the low end and adjust C3 until you hear a buzzing.



Author's model in plastic box. Metal box will detune RF oscillator if any side is too near L1.



Pattern of equally spaced bars produced by correctly adjusted height and linearity controls.

### How it Works

The patterner consists of an RF oscillator and an audio-frequency pulse modulator. The RF oscillator portion consists of Q1, L1, C1-C4, R1 and R2. The values of L1 and C1 were chosen so the output frequency would fall within TV channels 2 and 3. C2 feeds a small amount of RF from Q1's collector to its emitter to maintain oscillation. Base bias is supplied to Q1 by the voltage divider consisting of R1 and R2.

Q1 is emitter-modulated by returning its emitter to ground through the primary (used as a secondary in this circuit) of AF pulse-modulator transformer T1.

The secondary of T1 (used as a primary in this circuit), in conjunction with Q2, C5, C6, C7, R4 and R5, form the pulse-modulator oscillator. R5, by changing the base bias applied to Q2, varies the oscillator frequency and hence the number of horizontal lines that appear on the TV screen. If the oscillator frequency is 120 cps, two horizontal lines will appear. A frequency of 180 cps will produce three lines and 240 cps will produce four lines. If you want more lines than can be produced by R5, reduce the value of C5 to .05 mf.

R3 and C5 sharpen the pulses generated by Q2 to add definition to the horizontal bars. Though a 2N107 was specified for Q2, any inexpensive general-purpose, small-signal audio transistor will work.