

PHOTOELECTRONIC ANNUNCIATOR

Momentarily interrupt the beam of light shining on Q1, and you get a one-second "beep" from this circuit. Most likely you've encountered circuits of a similar nature in retail stores, where the buzzing sound signals your entrance and alerts salesmen to their prey. Obviously, a great many other applications are possible as well.

With light shining on Q1's sensitive face, the phototransistor conducts heavily and shunts current away from the base of Q2. But when the beam of light is interrupted, Q1 ceases to conduct—thus allowing current to flow through R1 and R2 into Q2's base. The collector of Q2 then conducts current and rapidly discharges capacitor C1. This allows Q3's gate lead (G) to swing high, thereby turning on Q4, Q5 and the buzzer.

Assuming that the interruption of the beam was only temporary, Q2's collector will now have ceased to conduct current. This allows C1 to charge until it

reaches a level sufficient to trigger Q3, a programmable unijunction transistor (PUT). When that happens (in about 1 second), Q3's gate potential drops, which turns off Q4, Q5 and buzzer. Another interruption will repeat the whole process and yield one more "beep."

PARTS LIST FOR PHOTOELECTRONIC ANNUNCIATOR

- BZ1**—piezoelectric buzzer, 6-9 VDC
- C1**—22 μ F, 16V electrolytic capacitor
- D1**—1N914 silicon diode
- Q1**—FPT-100 NPN phototransistor
- Q2, Q4, Q5**—2N3904 NPN transistor
- Q3**—2N6027 programmable unijunction transistor
- R1**—22,000-ohm, $\frac{1}{2}$ -watt resistor, 10%
- R2 R5**—220K-ohm, $\frac{1}{2}$ -watt resistor, 10%
- R3**—62,000-ohm, $\frac{1}{2}$ -watt resistor, 10%
- R4**—470K-ohm, $\frac{1}{2}$ -watt resistor, 10%

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