

A SIMPLE TOUCH CONTROL SWITCH

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Single FET amplifier circuit can be used to control relay or other low-current device

A TOUCH control is an electronic switch that can be activated simply by touching a small conductive plate with a fingertip.

Such controls are easy to build and can be used to enhance many projects. They can also be added to an existing circuit, such as forming an alarm "off" switch for a digital clock.

Circuit Operation. A basic touch control circuit is shown in Fig. 1A. Essentially, it consists of a FET amplifier with a high input impedance (10 megohms) and a conductive touch plate connected to its gate. Operation occurs when the ambient 60-Hz ac field flooding the area is impressed on the touchplate during the finger contact. This signal is amplified and appears at the drain as a 60-Hz square wave, alternating between ground and supply voltage.

Capacitor *C1* shunts any r-f picked up by the "antenna effect" of the touchplate, while capacitor *C2* acts as a transient suppressor.

The drain of *Q1* can be connected to the alarm-off pin of a clock chip, since most of these ICs require that the alarm-off pin be momentarily connected to the supply voltage to silence the alarm.

The circuit of Fig. 1B uses the same FET input stage, but, via *D1*, rectifies the ac waveform at the *Q1* drain and uses the generated positive voltage to turn on transistor *Q2*. The positive voltage developed across *C3* will keep *Q2* turned on until the capacitor is discharged by base current and resistor *R_x*. The value of this latter resistor determines how rapidly the switch will shut off and should be between 10,000 and 100,000 ohms.

The load on *Q2* can be a low-current relay or a resistor (1000 to 5000 ohms) with the signal generated across the resistor used to turn on a high-power transistor. Using the transistor shown for *Q2*, any device that requires 50 mA or less can be powered.

Construction. Any form of construction may be used since the circuit is relatively simple. It should be powered from an ac-line supply for reliable operation.

The touch plate should be relatively small—several square inches are enough. It must be insulated from ground. But it need not be a discrete metal plate; a metal door-knob on a wooden door will suffice. This latter type of touchplate makes an excellent sensor in an alarm project. ◇

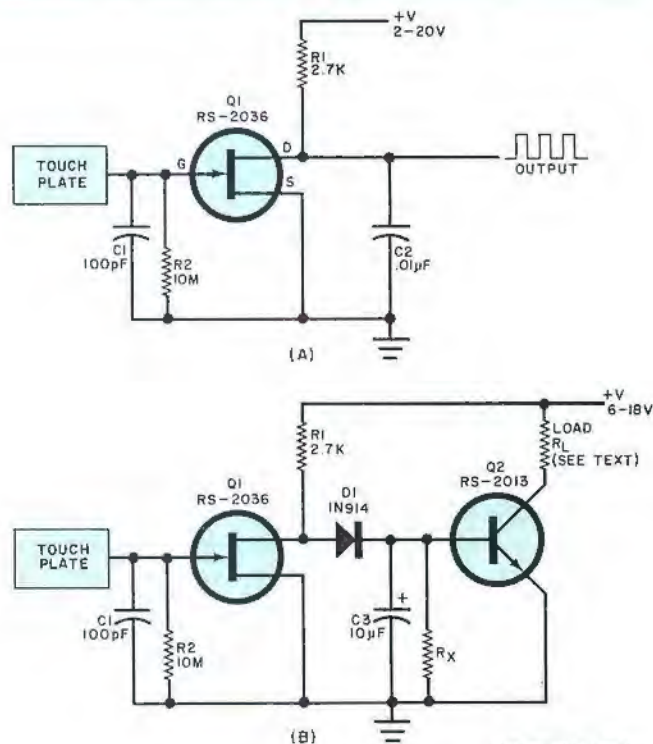


Fig. 1. At (A), high input impedance FET develops a square-wave output when gate is touched by fingertip. Transistor *Q2* (B) is added to drive external devices.

PARTS LIST

- C1 — 100-pF, disc
- C2 — 0.01-μF, disc
- C3 — 10-μF, electrolytic
- D1 — 1N914 or similar
- Q1 — N-channel FET, RS2036 or similar
- Q2 — Npn transistor, RS2013 or similar
- R1 — 2700-ohm resistor
- R2 — 10-megohm resistor
- R_x — 10,000 to 100,000 ohms (see text)
- Touchplate — see text.
- Misc. — Perf board, mounting hardware, power supply, etc.