Additional Useful Materials...

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Simple D/A Converter

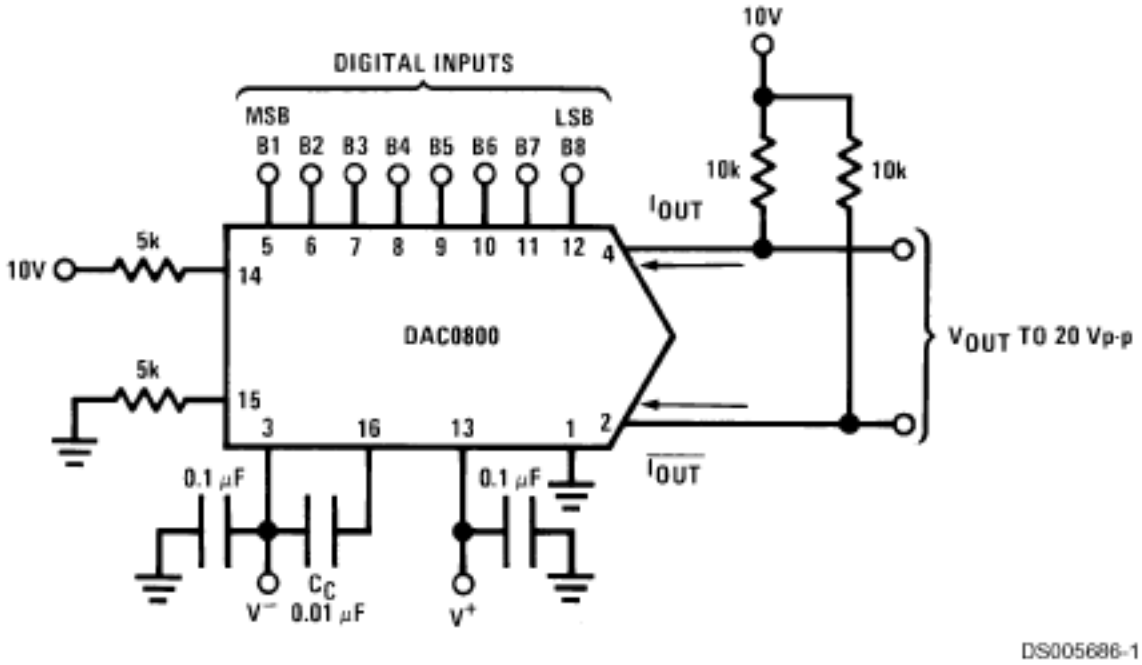
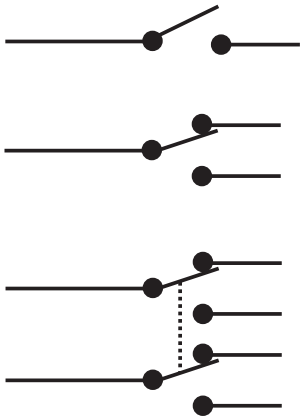


FIGURE 1. ±20 V_{P-P} Output Digital-to-Analog Converter (Note 5)

Source: National Semiconductor DAC0800 datasheet.

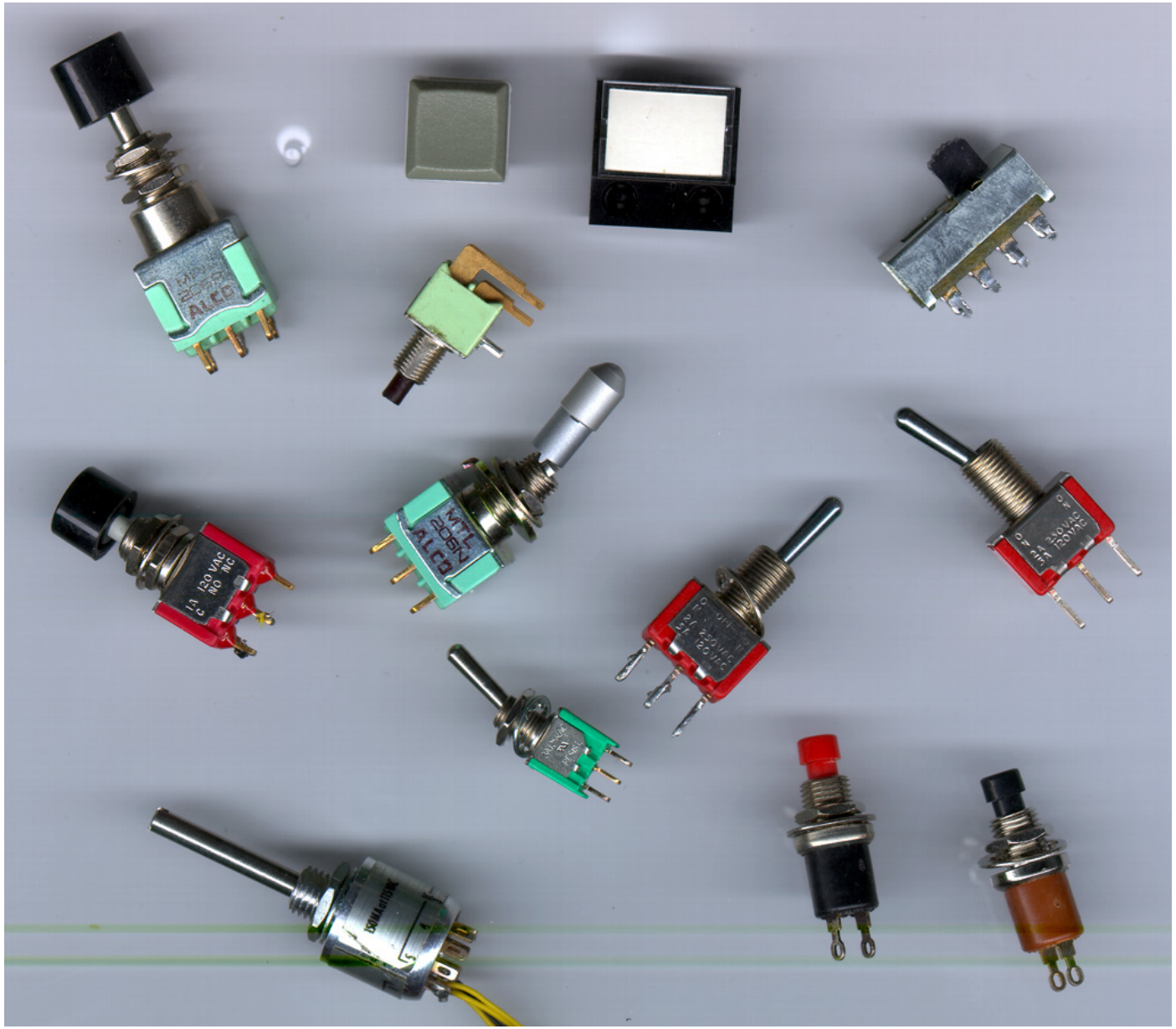
All About Switches

- Switches are available in a wide variety of types.
- Normally, they are identified by the number of contacts and the number of positions, or "throws" for each contact. The most popular:
  - SPST = single-pole, single-throw
  - SPDT = single-pole, double-throw
  - DPDT = double-pole, double-throw

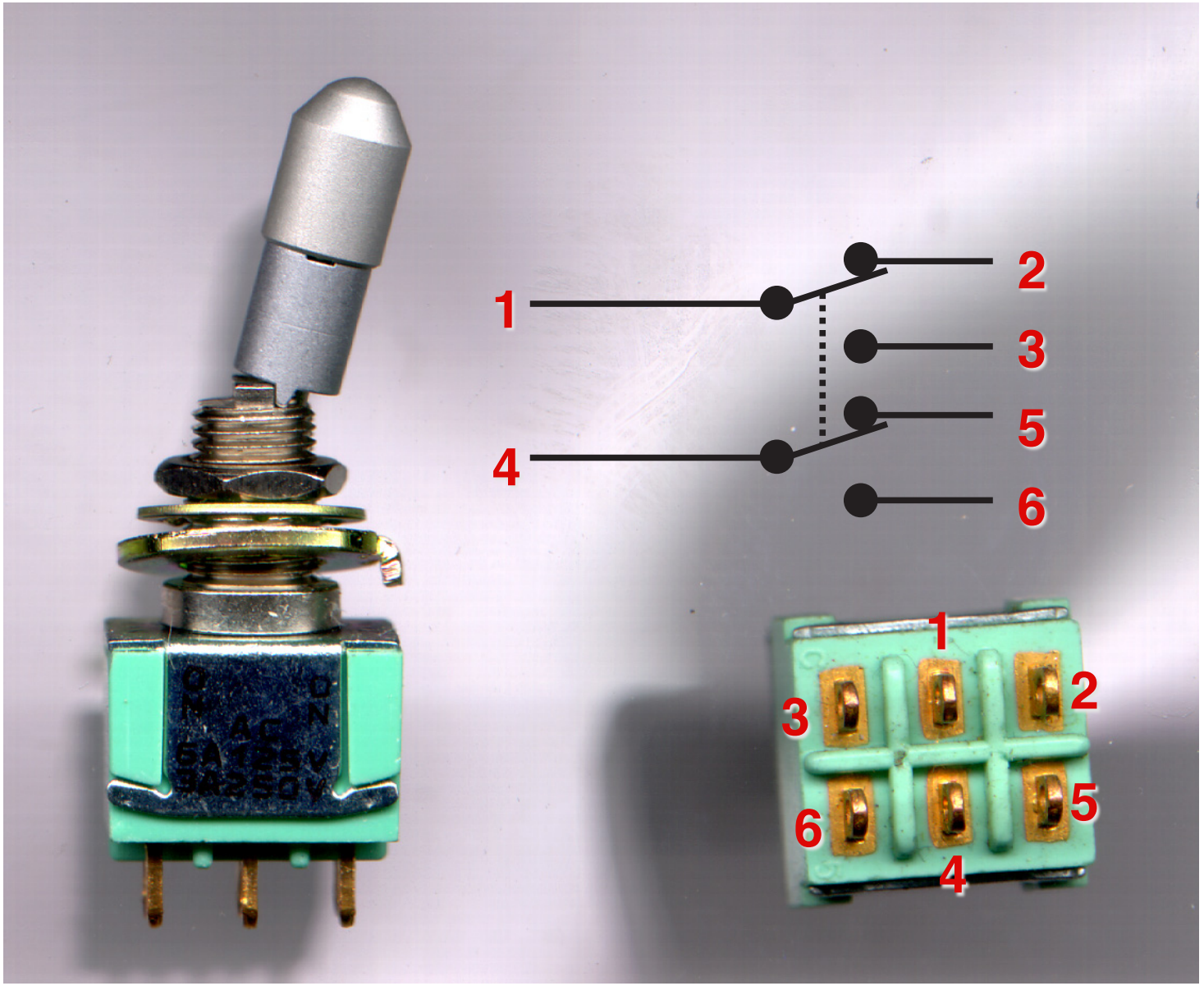


- Switches are also either latching or momentary.
- Current and voltage ratings are important if significant power is to be controlled.

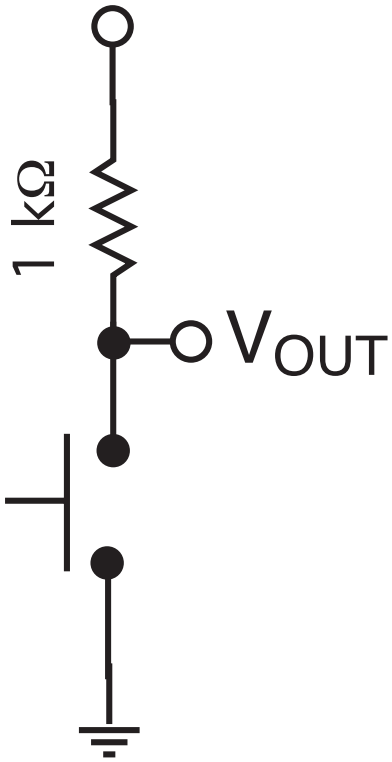
Example Switches

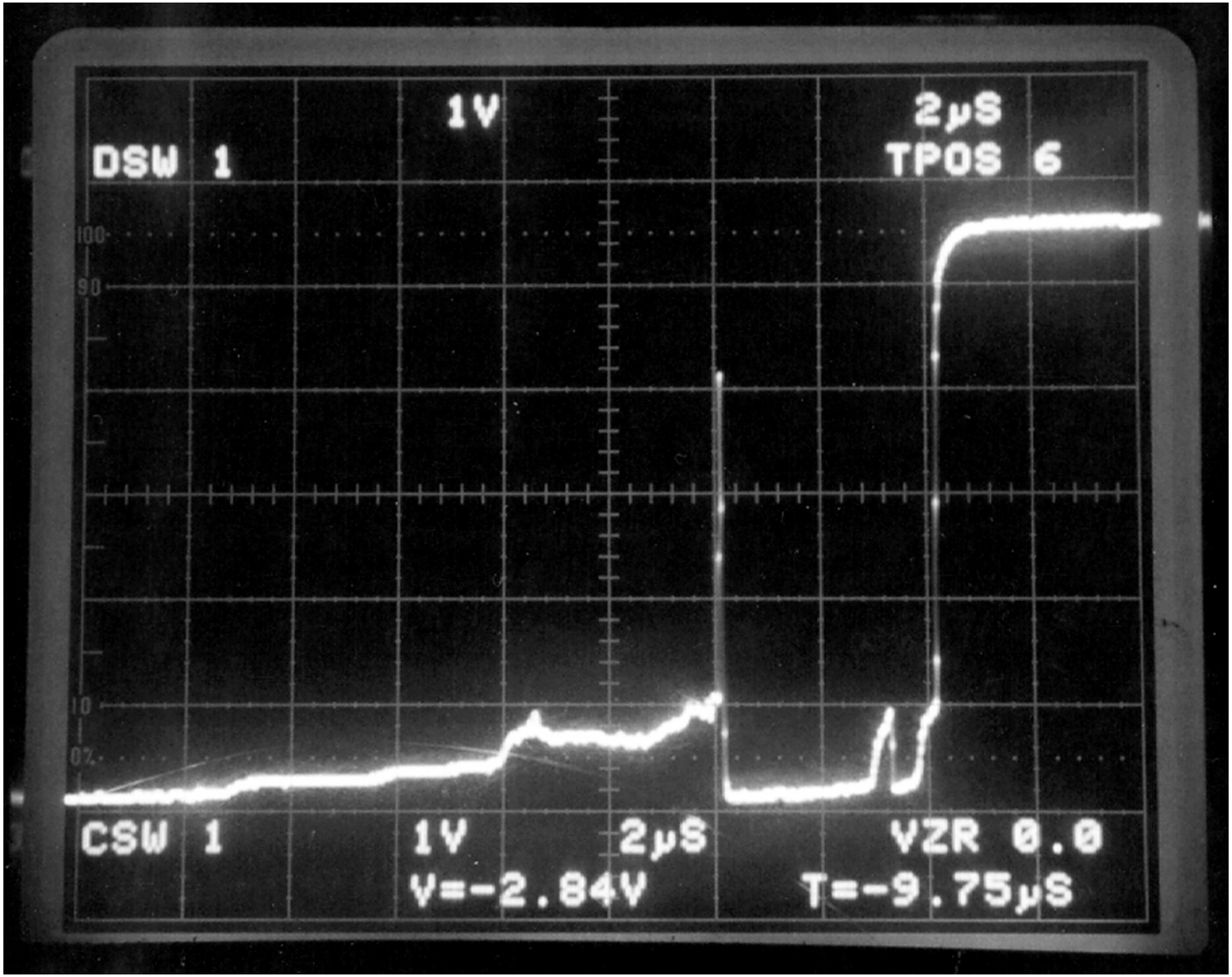


Typical DPDT Connections

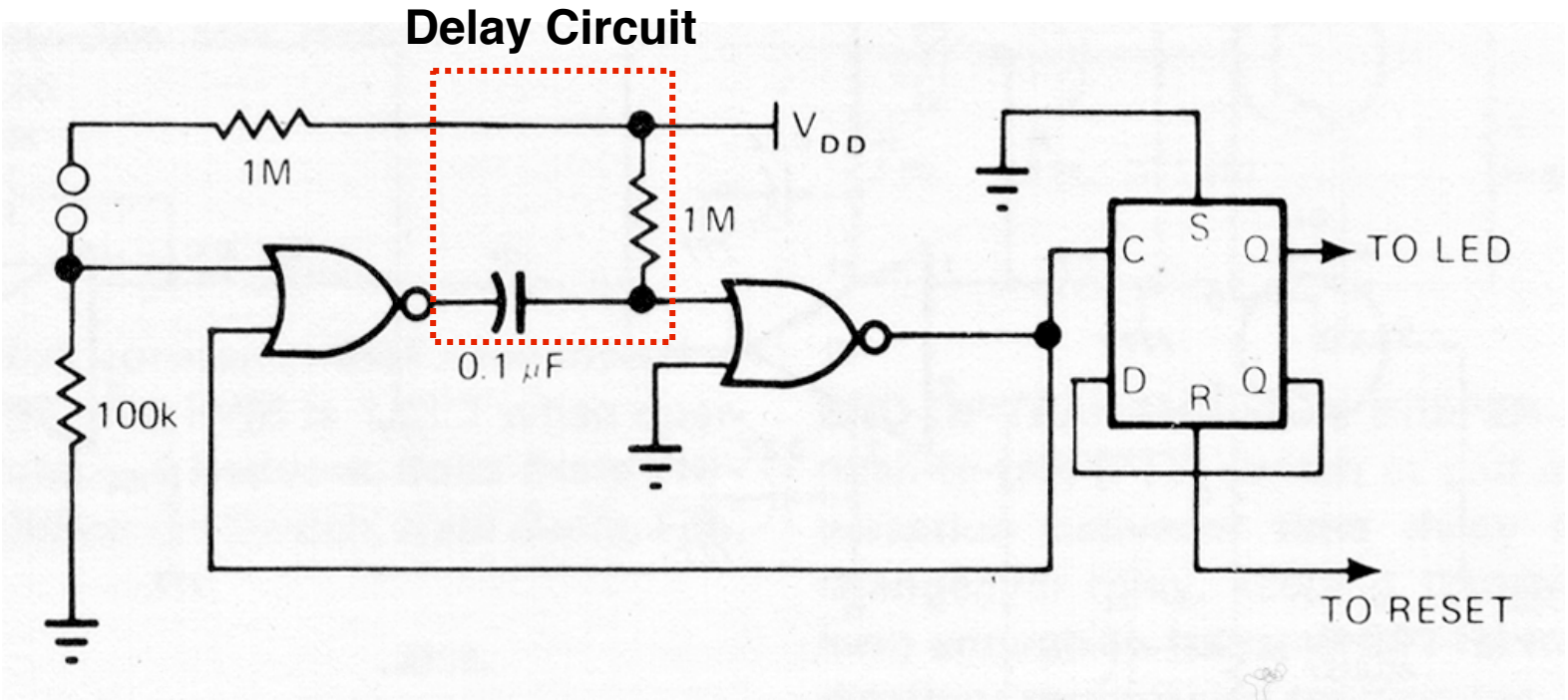


Switch Bounce





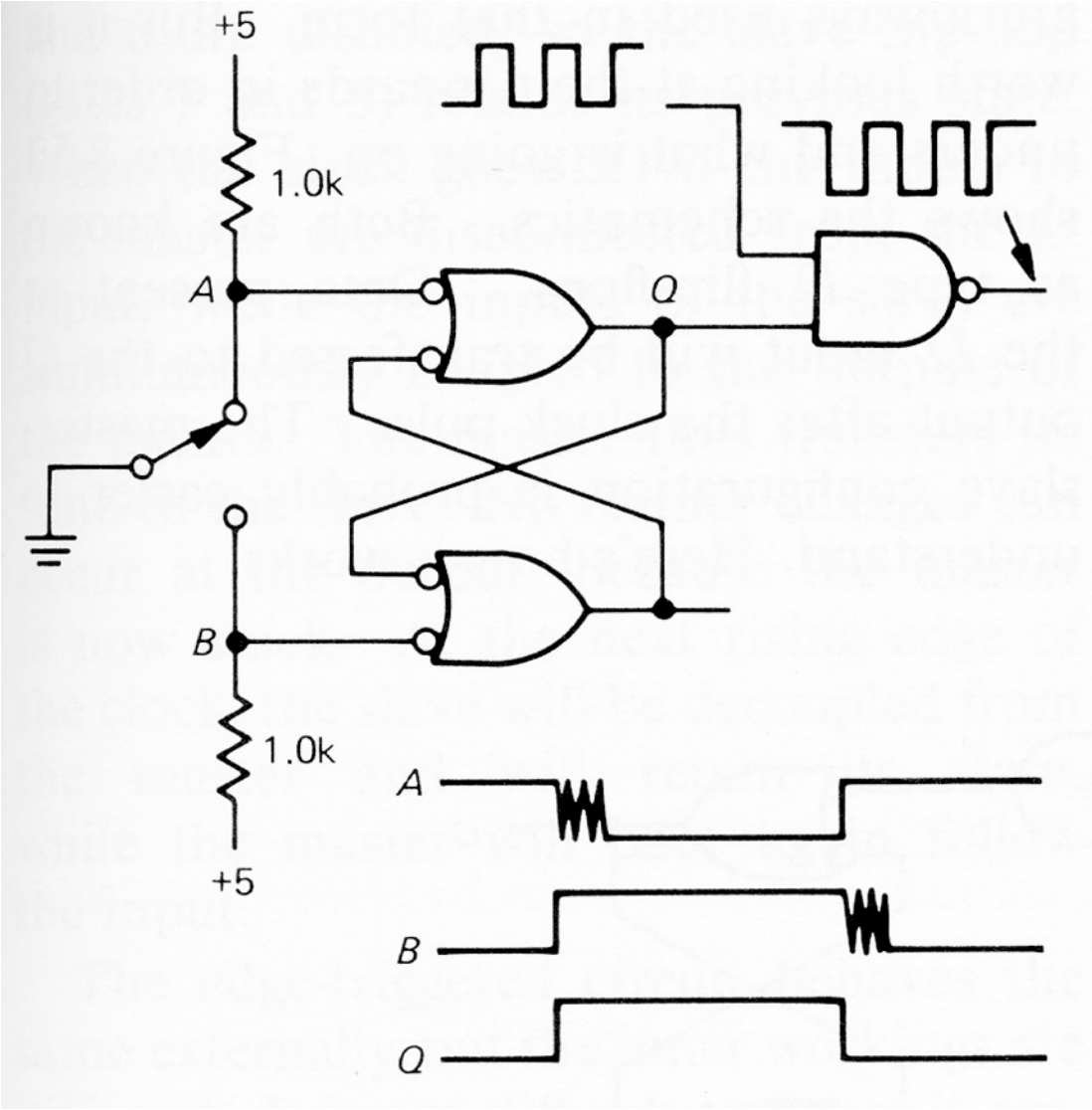
A Debounce Strategy



Works with a conventional pushbutton switch or as a touch switch.

Source: V. Gregory, EDN Magazine, May 5, 1976, p. 112

Another Debounce Strategy



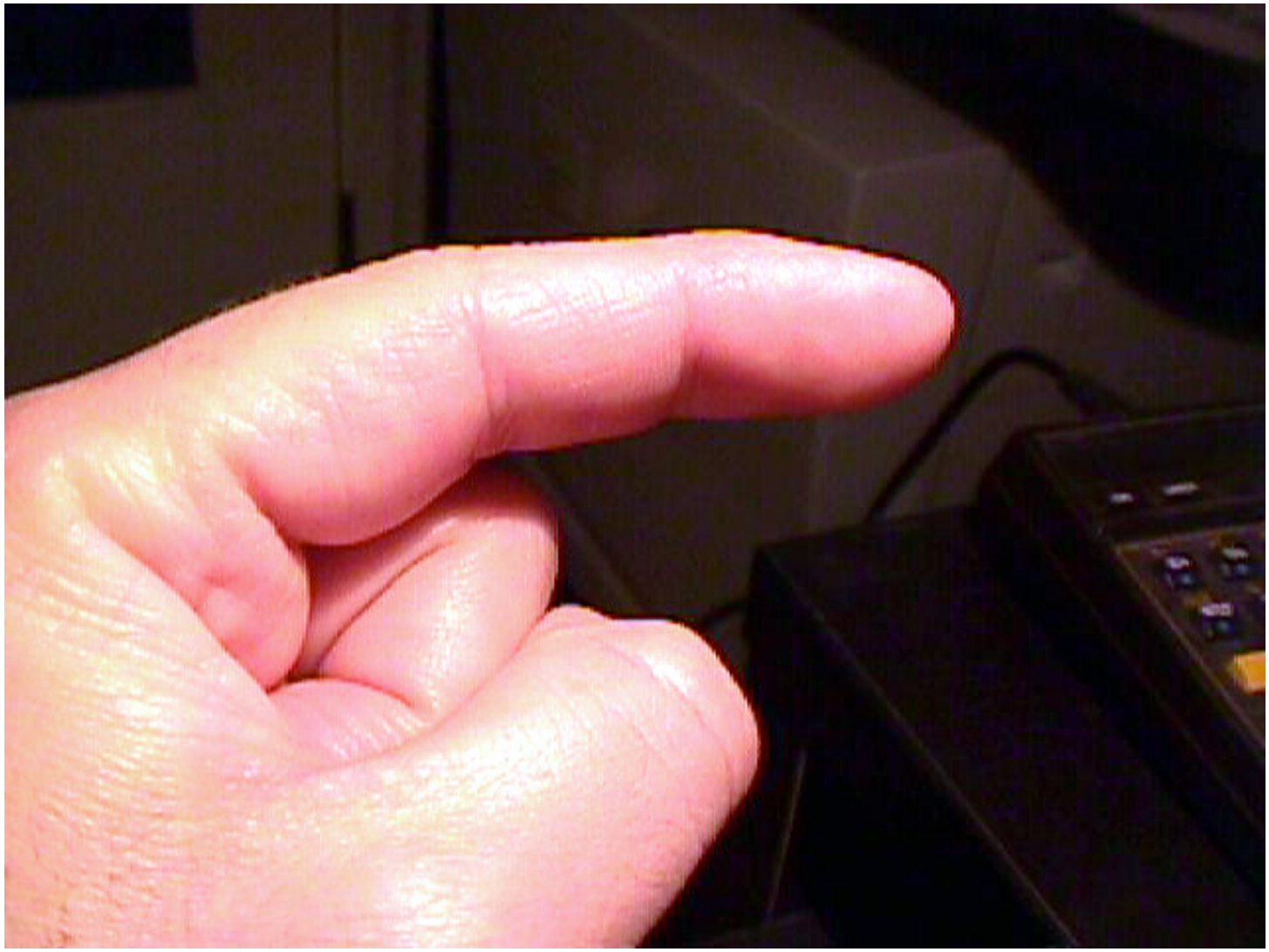
Source: Horowitz & Hill, Second Edition, Cambridge University Press, 1989.

Commercial Debounce Chips

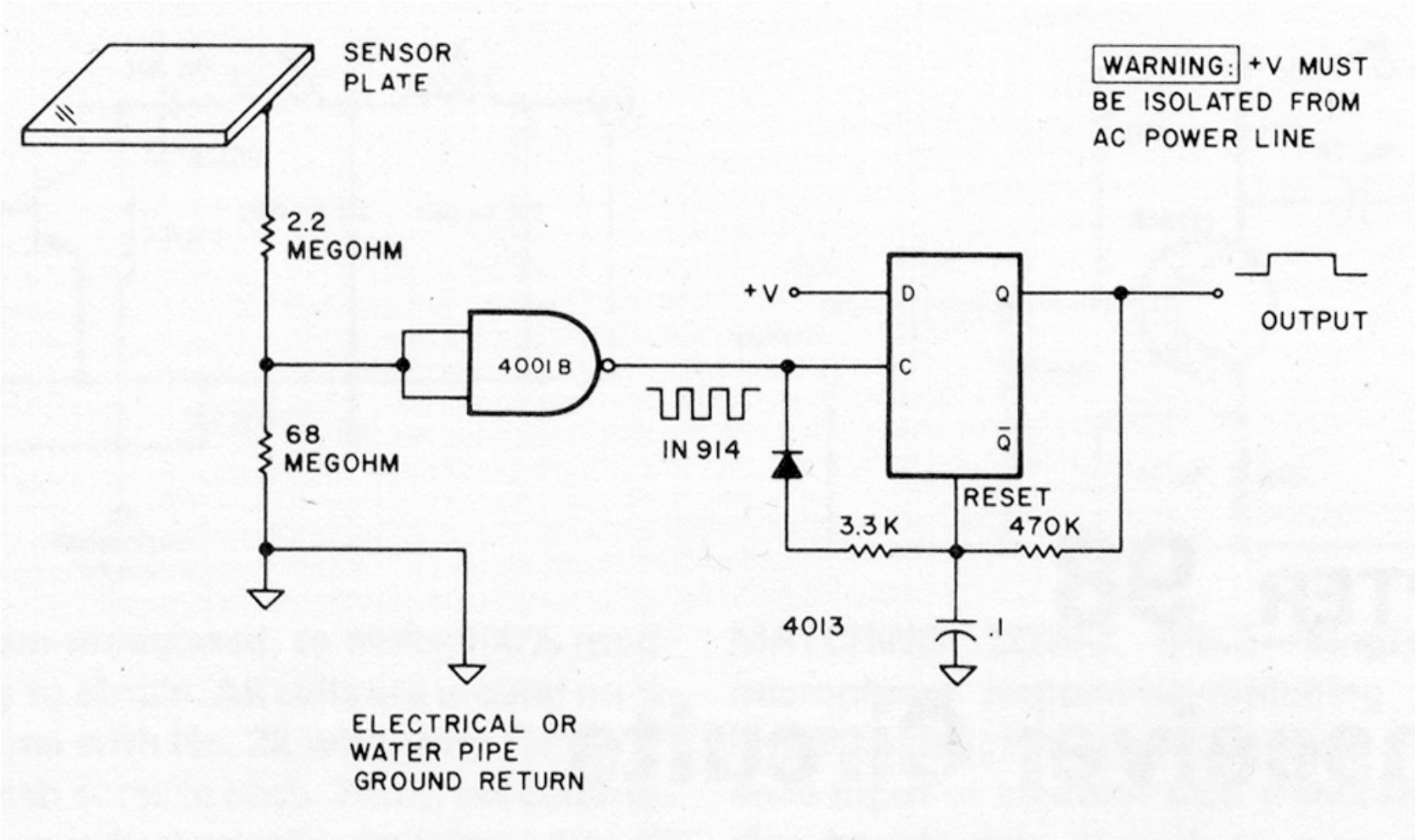
- There are commercially available integrated circuits specifically designed for switch debouncing.
- A good example is the Maxim 6816 and related chips, which interface directly between mechanical switches and logic circuits.
- The MAX6816 is a one-switch unit in a tiny 4-pin SOT-23 package, and the 6817 is a two-switch unit in a 6-pin SOT-23.
- The MAX6818 handles eight switches and provides a signal if any are pressed (can be used to interrupt a microprocessor or load a latch, for example.)

Outstanding Cubicle Prank of 2000

Another Type of Switch



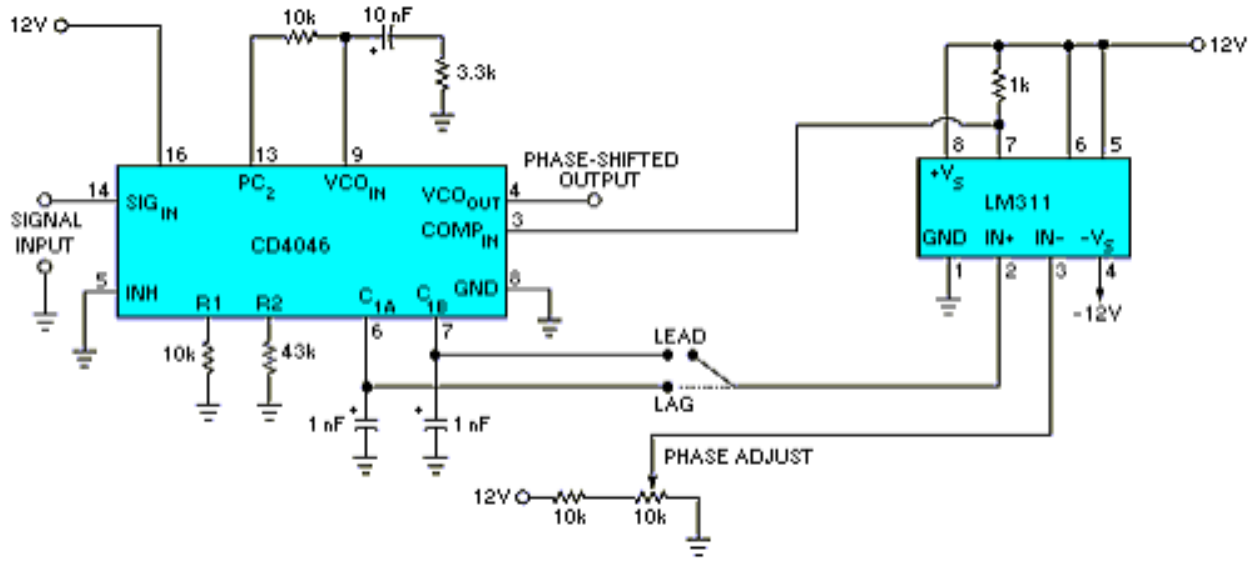
Touch Switch That Uses Noise



Source: D. Lancaster, Clocked Logic, Kilobaud Magazine, May 1977, pp. 24 - 30.

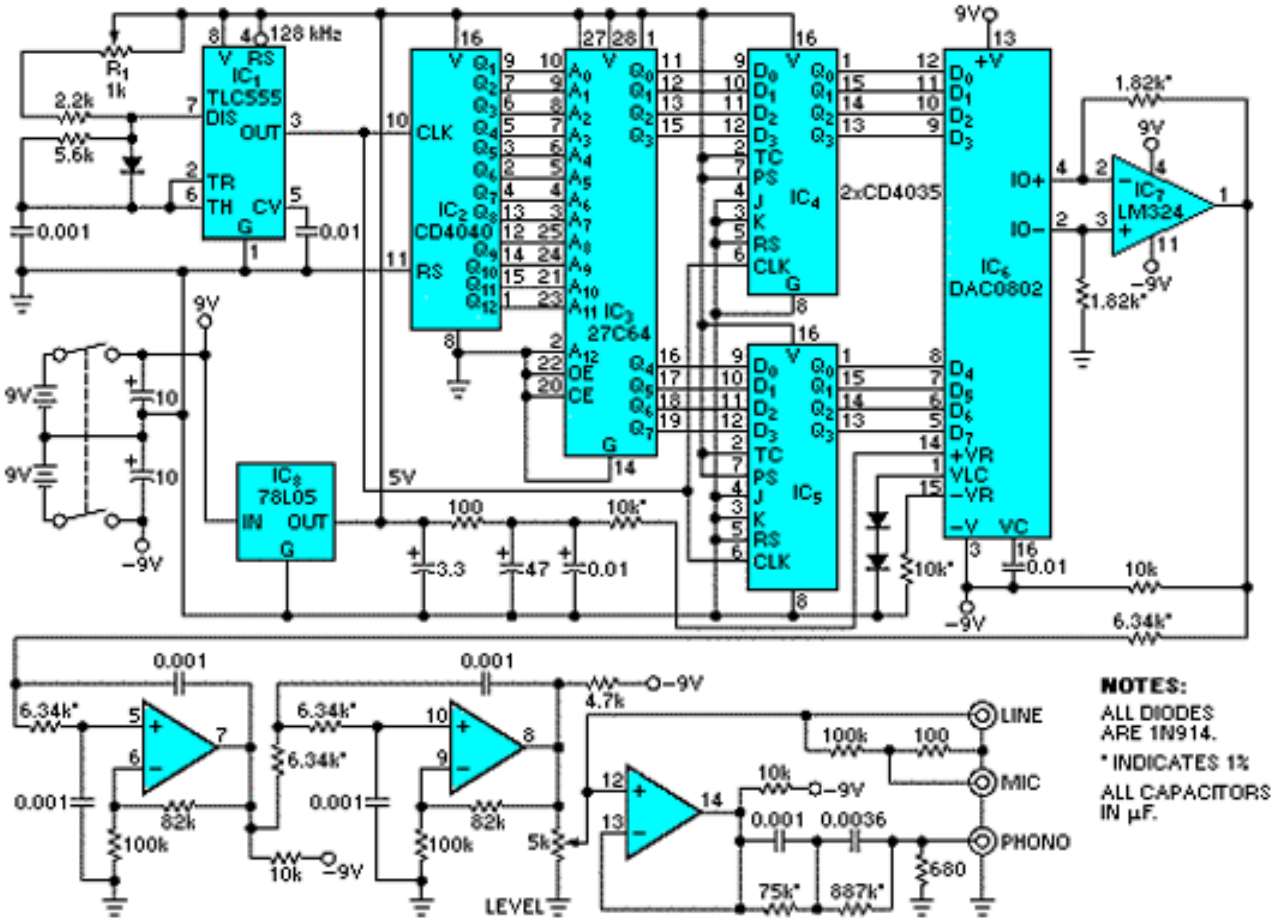
What Was Marketing Thinking?

Design Idea: PLL Phase Shifter



Source: H. Karaca, EDN Magazine.

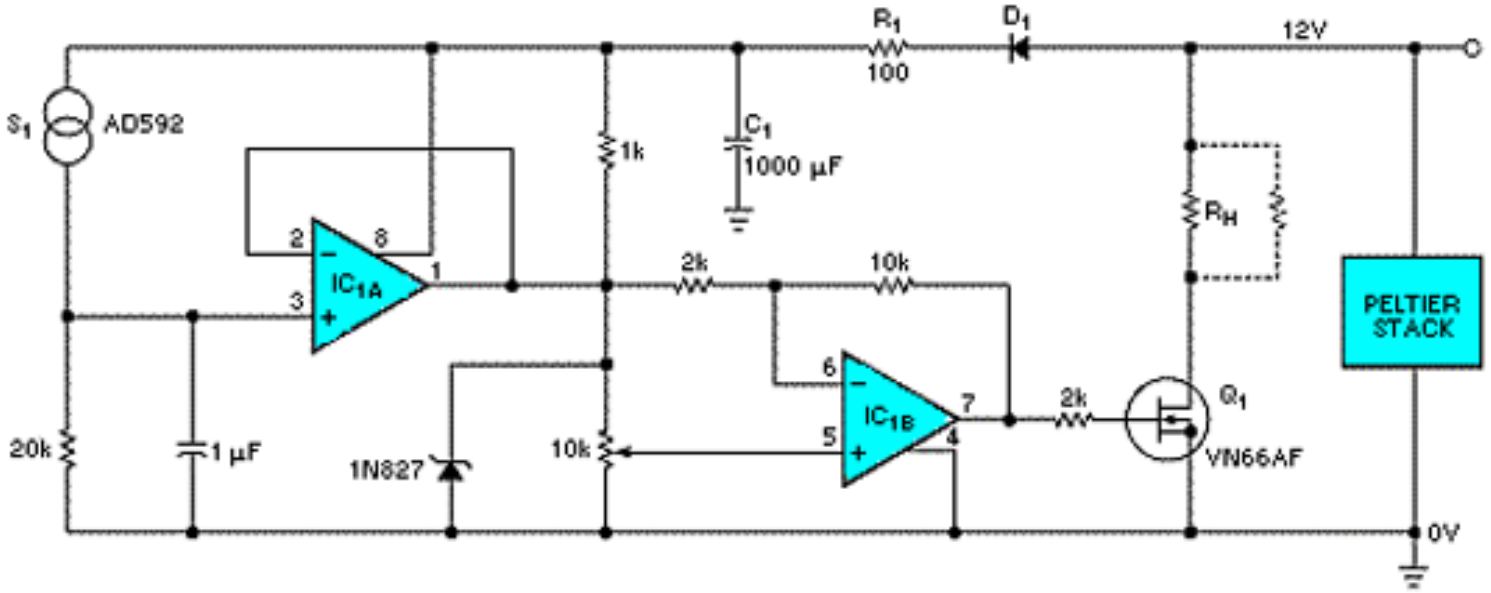
Design Idea: 10-Octave Audio Generator



Source: W. Sward, EDN Magazine.

Contributed by: Gene Berdichevsky, Fall 03/04

Design Idea: Novel Peltier Controller

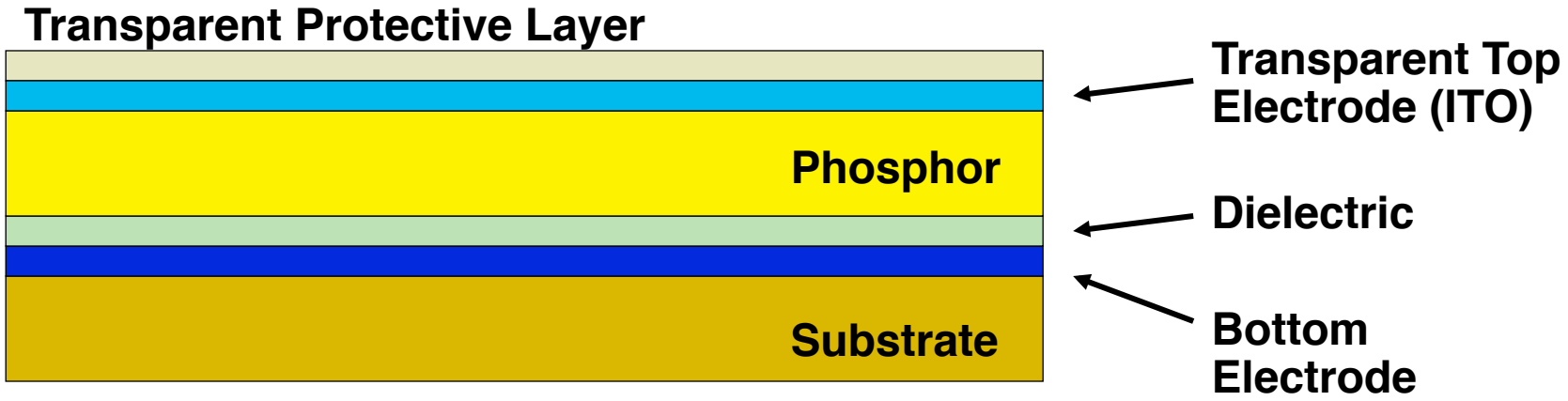


Source: T. Preston, EDN Magazine.

Electroluminescent Lamps

- Low-cost, flexible devices for generating light (common as LCD backlights).
- Circuit model: leaky capacitor (≈ 3 - 6 pF/in^2 with a parallel resistance of ≈ 50k - 1.5MΩ/in^2).
- Usually driven at 120 VRMS and 400 Hz.
- Many drive circuits and chips exist

EL Lamp Structure



EL Lamp/Chip Sources

EL LAMPS

- **Durel Corp. (602) 917-6000, www.durel.com**
- **MetroMark, Inc. (800) 680-5556, www.metromark.com**
- **LSI (603) 448-3444, www.metromark.com**

CHIPS

- **Durel (as above)**
- **IMP, Inc. (408) 744-0100, www.impweb.com**
- **Sipex Corp. (978) 667-8700, www.sipex.com**
- **Supertex, Inc. (408) 744-0100, www.supertex.com**

Last Year's Toys = Tomorrow's Hack!