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Four DIPs provide as many as 80 sequential-LED outputs

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A previous Design Idea makes clever use of the ability of the 4017 CMOS counters to accept either positive or negative edge-clock signals, even though it leaves two LEDs on at once (Reference 1). But what happens if you want more than 19 counts? A quick check in some old CMOS data books uncovered a circuit for using 4017 counters to make sequential displays. However, this approach sacrifices some outputs and yields nine outputs for the first counter and only eight for each subsequent one. It also requires you to add an AND gate between each successive counter stage.

The circuit in Figure 1 differs from the one in the earlier Design Idea in that it uses HCMOS parts and adds one 74HC540 to facilitate a simple means of multiplexing the outputs of two 4017 counters for as many as 80 outputs. The 74HC540 is a convenient pinout version of the venerable 74HC240-series bus drivers. By including a DIP-resistor network, you can also reduce the discrete-component count for the design. The recommended current-sourcing capability of the HC-series parts at 6V supply is slightly lower than that of the 4000-series parts at 15V, but the reduced resistor losses provide a more energy-efficient circuit if you use better LEDs.

The figure omits the necessary supply-bypassing capacitors or a clock or power-on-reset circuit. D_1, D_2, and R_1 form a simple AND gate, which you might use instead of an external reset input to form a continuous ring counter, at which the cathodes connect to selected outputs of each of the counters, IC_1 and IC_2.**EDN**

REFERENCE
1 Tregre, Jeff, "Cascade two decade counters to obtain 19 sequential outputs," EDN, Dec 14, 2007, pg 62, www.edn.com/article/CA6512153.
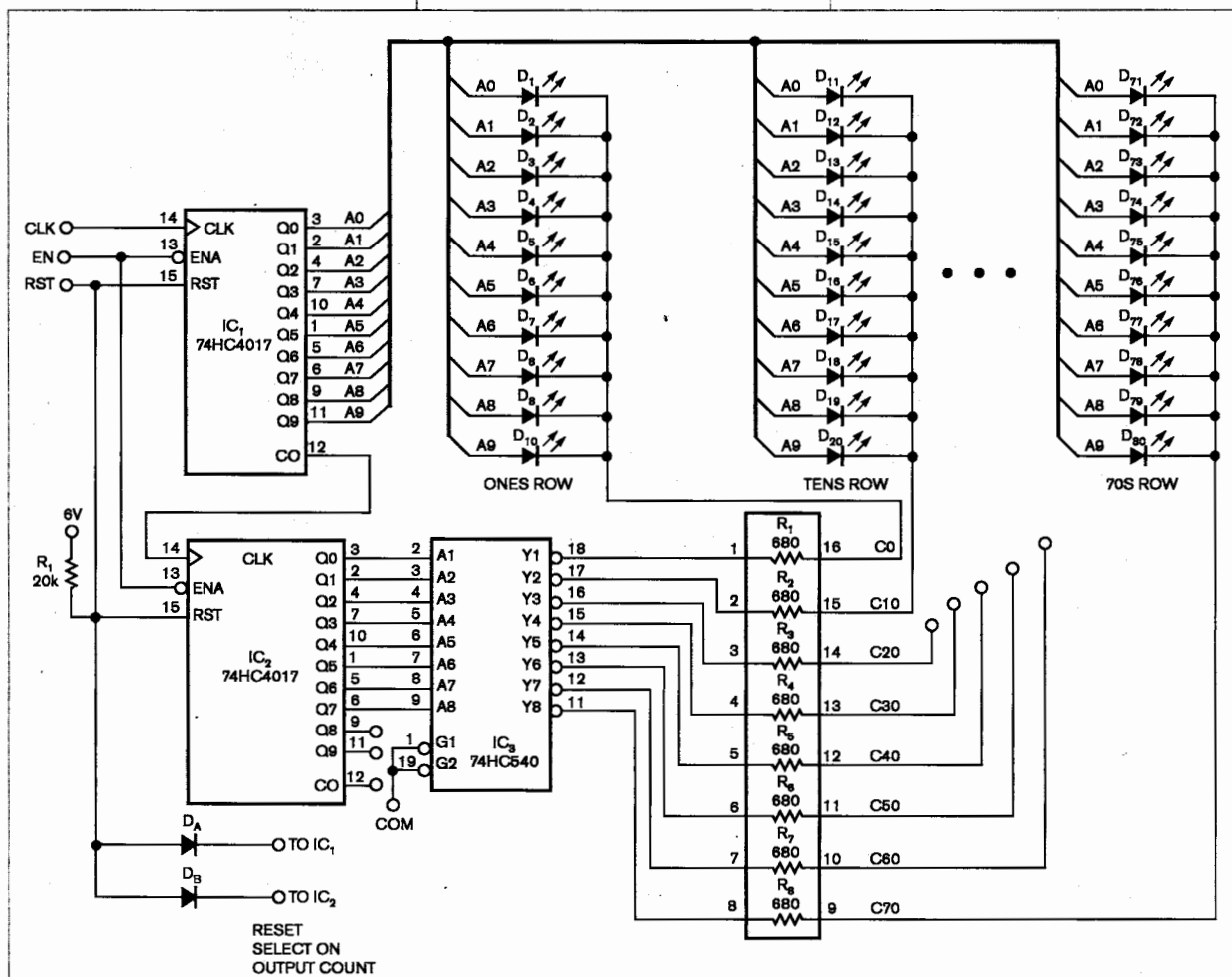

Figure 1 This circuit provides a simple means of multiplexing the outputs of two 4017 counters for as many as 80 outputs.