



*Solid-state version
uses LED's as
the spinning ball.*

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ELECTRONIC WHEEL OF FORTUNE

SIMULATES MECHANICAL GAME



THE WHEEL of fortune has always been one of the favorite games of chance. Perhaps it is because of the fascination of watching the wheel go around and around and not knowing where it will stop. You can build an electronic roulette which has little red lights going around and around, stopping eventually at a completely randomly selected number between 1 and

16. Players can select their number for each spin of the wheel, watch the lights, and collect their winnings if the light stops on their number. Like a mechanical wheel, the lights go fast at first and then slow down gradually before stopping at the winning number.

Circuit Operation. As shown in Fig. 1, a clock oscillator (*IC1*) operates at

about 100 Hz when the SPIN pushbutton is depressed. When the switch is released, a time constant in the circuit causes the oscillator to slow down to a stop in about 10 seconds. The output of the clock is conditioned for the TTL logic by transistor *Q1*.

To understand how the 16 LED's are operated, note that the combinations of numbers 1 and 9, 2 and 10, through 8 and 16 are driven by the output of the first flip-flop and the 8-bit shift register. However, the selection of which of the eight combinations is in the circuit at one time is made by the state of the second flip-flop. As the clock delivers pulses to the first flip-flop, the digital one level is propagated from 1 through 8 on the LED's.

At the eighth clock pulse, the output of *IC3* operates a one-shot (*IC2*). This causes the output flip-flop to change states, so that the second eight LED's are selected. Simultaneously, the first flip-flop and the shift register are

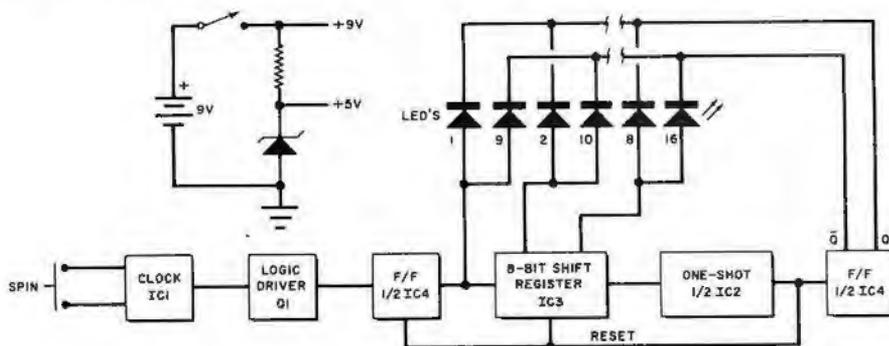


Fig. 1. Pressing the SPIN button starts the clock oscillator.
← CIRCLE NO. 33 ON FREE INFORMATION CARD

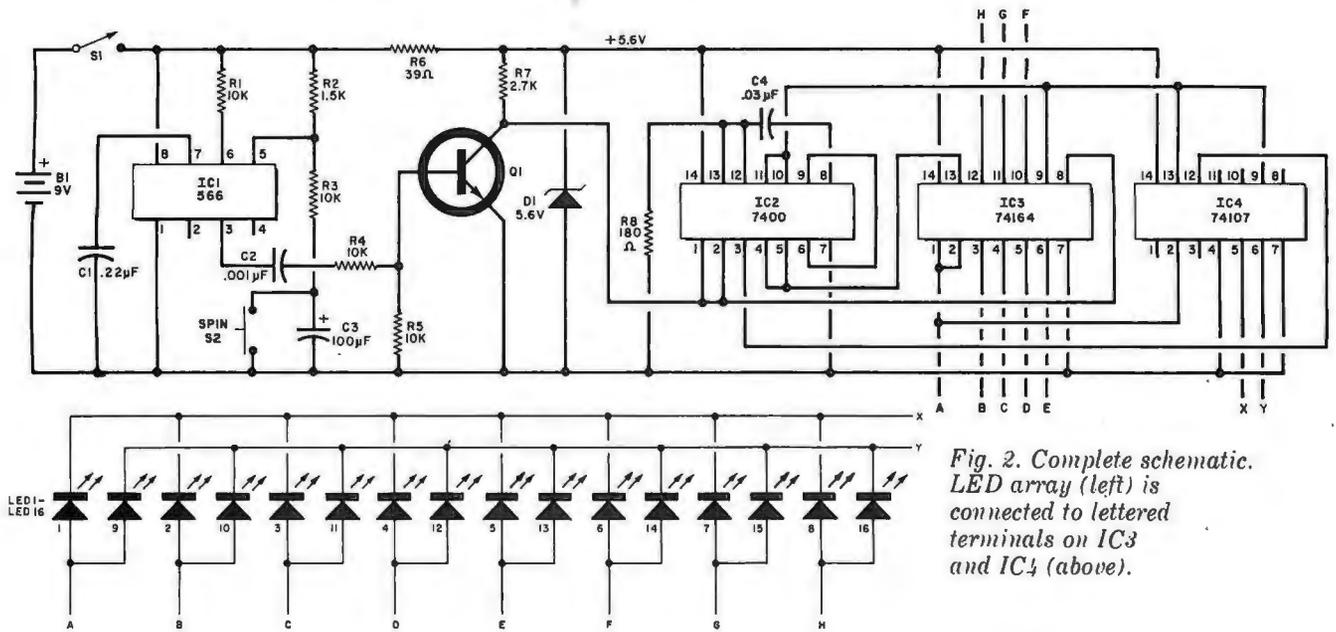


Fig. 2. Complete schematic. LED array (left) is connected to lettered terminals on IC3 and IC4 (above).

PARTS LIST

- B1—9-volt battery (6 C cells)
 - C1—0.22- μ F capacitor
 - C2—0.001- μ F capacitor
 - C3—100- μ F, 15-V electrolytic capacitor
 - C4—0.03- μ F capacitor
 - D1—5.6-V zener diode
 - IC1—Function generator (566)
 - IC2—Quad 2-input NAND gate (7400)
 - IC3—8-bit shift register (74164)
 - IC4—Dual JK flip-flop (74107)
 - LED1 to LED16—Light emitting diode
 - Q1—Silicon npn transistor
 - R1, R3-R5—10,000-ohm, $\frac{1}{4}$ -W resistor
 - R2—1500-ohm, $\frac{1}{4}$ -W resistor
 - R6—39-ohm, $\frac{1}{4}$ -W resistor
 - R7—2700-ohm, $\frac{1}{4}$ -W resistor
 - R8—180-ohm, $\frac{1}{4}$ -W resistor
 - S1—Spst switch
 - S2—Normally open spst pushbutton switch
 - Misc.—Suitable enclosure, press-on type, C-cell holders, insulated wire, mounting hardware, etc.
- Note—The following are available from Hosfelt Electronics, 224 Opal Blvd., Steubenville, OH 43952: etched and drilled printed circuit board at \$5.00; case and engraved front panel at \$5.00; complete kit of parts at \$24.95.

reset. In this way, the same logic is used for all 16 LED's. The complete schematic is shown in Fig. 2.

Construction. The circuit can be assembled on perforated board or on a pc board such as that shown in Fig. 3. Be sure to observe the polarities and coding on all components and use a low-power soldering iron. Note that there are three jumpers on the board.

The prototype was housed in a plastic enclosure $6\frac{1}{2}'' \times 3\frac{3}{4}'' \times 2''$. As shown in the photo, the cover of the box was drilled for the 16 LED's arranged in a

circle. The holes should be just large enough to fit the tops of the LED's. The lights can be identified at random using press-on type. The two switches can be mounted on the cover as shown.

Since the project has a current drain of about 100 mA, six C cells, in holders mounted on the bottom of the enclosure, can be used. This allows about 10 mA for the LED's. Any color can be used for the LED's, but it is advisable to have a few extras so that they can be selected to have all 16 glow with about the same brilliance. \blacklozenge

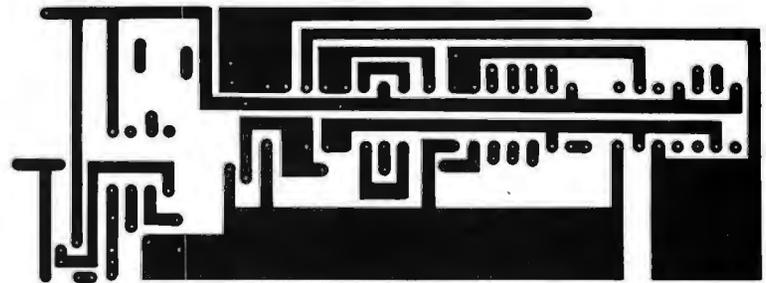


Fig. 3. Etching and drilling guide above; component layout below.

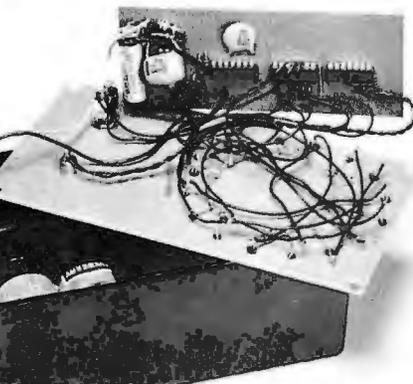
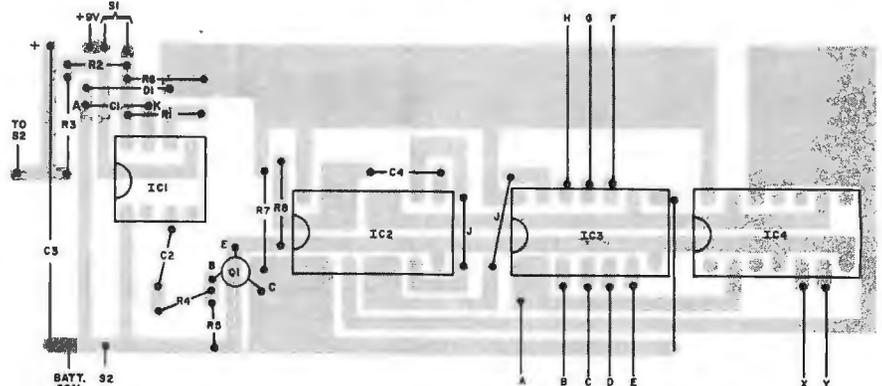


Photo shows how LED's were arranged on top of the enclosure.