

"Heads or tails" — electronic decision maker!

THIS SIMPLE novelty circuit is designed to electronically simulate the tossing of a coin; randomly producing a 'heads' or 'tails' output. The output of the unit is displayed on two LEDs, one being marked 'heads', and the other being given a 'tails' legend. The unit has a pushbutton switch which is briefly pressed in order to 'toss the coin', and only one of the LEDs will be switched on when this switch is released, indicating the 'decision' of the unit.

The circuit uses Q1 and Q2 in what is virtually a standard astable multivibrator circuit. The only deviation from the standard configuration is the inclusion of pushbutton switch SW1 in the bias circuit for Q1. As the circuit stands there is no bias to Q1, and the circuit therefore fails to oscillate. However, if SW1 is operated the circuit can function normally. A roughly square

wave output is then produced at the collector of Q2, and the specified values give an operating frequency of many kilohertz.

This square wave output is fed to a 4017 divide-by-ten circuit, which is used here effectively as a form of bi-stable circuit. After each five input cycles, the output of IC1 (pin 12) changes state, and while the clock oscillator is functioning, this output therefore changes state a few thousand times per second. LED1 and LED2 are the two indicators, and are driven from the output of IC1 via current-limiting resistors R5 and R6. When IC1's output is low, R6 and D2 are effectively short circuited by the output stage, but D1 will be switched on. Conversely, when the output is high D1 and R5 are short circuited, and it is D2 that is switched on. While the oscillator is running, both

LEDs appear to be switched on since the switching action is far too rapid for a human observer to perceive. When SW1 is released and the oscillator stops, IC1 will stay in whatever output state it happened to have at the instant the oscillator stopped. There is, of course, no way of predicting which state this will be, and which of the LEDs will be switched on. It is purely a matter of chance whether the unit indicates 'heads' or 'tails'.

SW2 is the on/off switch. The current consumption of the circuit is only about 5 mA.

