

BUILD A LOW-COST 1-Hz to 1-MHz Frequency Counter

*Sophisticated,
low-cost counter
with 3-digit
readout uses
state-of-art
CMOS chips.*

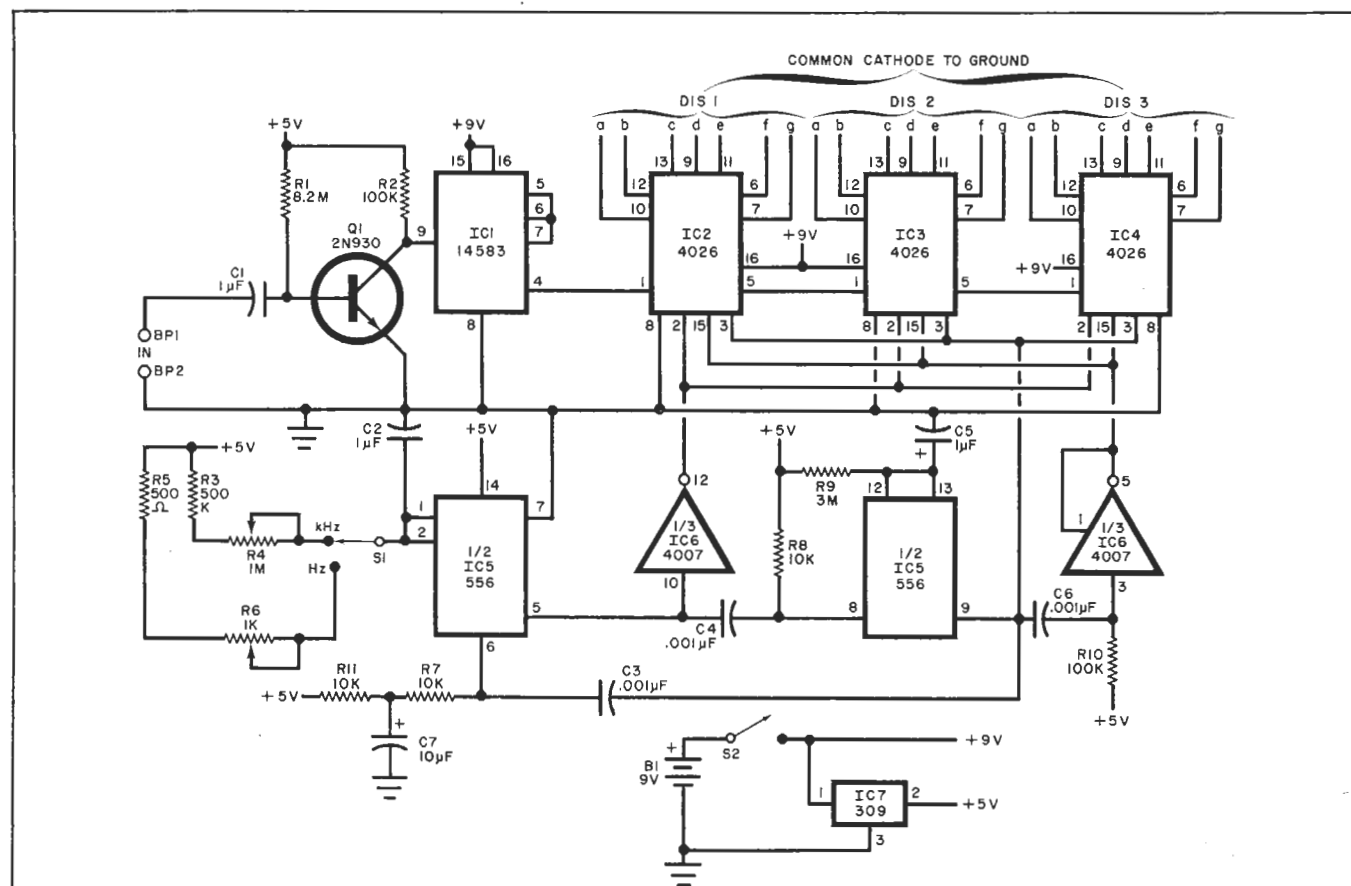
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A FREQUENCY counter can be as useful in working with electronic equipment as an oscilloscope, yet it is often the last piece of test gear the hobbyist and experimenter buys. The main reason for this save-for-last attitude stems from the fact that commercially made counters are relatively high priced. Now, however, the easy availability of inexpensive "surplus" IC's and low-current LED displays

makes it possible for you to build a low-cost, three-digit frequency counter with a range from 1 Hz to about 1 MHz). By shopping carefully (see the ads at the back of this magazine), you should be able to build your frequency counter for just about \$25 to \$30.

Circuit Operation. A frequency counter consists of a wave shaper that

should have a reasonably high input impedance and a series of decade counting units. The wave shaper "conditions" the input signal to give it the clean-edged waveform necessary to trigger the decade counting units. The outputs of the counters drive numeric displays. The entire operation is controlled by a time base that enables the counter for a precise period of time. During the enable in-



PARTS LIST

B1—9-volt alkaline battery
BP1, BP2—Binding post (one red, one black)
C1, C2, C5—1- μ F ceramic, Mylar, or polystyrene capacitor
C3, C4, C6—0.001- μ F disc capacitor
C7—10- μ F, 16-V, electrolytic capacitor
DIS1 through DIS3—Common-cathode 7-segment LED display (Motorola HEK-5 or similar)
IC1—14583 Schmitt trigger IC
IC2, IC3, IC4—4026 decade counter IC

IC5—556 dual timer IC
IC6—4007 dual complementary pair and inverter IC
IC7—5-volt regulator IC (LM309 or similar)
Q1—2N930 or similar transistor
Following resistors are $\frac{1}{4}$ watt:
R1—8.2 megohms
R2, R10—100,000 ohms
R3—500,000 ohms
R5—500 ohms
R7, R8, R11—10,000 ohms

R9—3 megohms
R4—Subminiature 1-megohm potentiometer
R6—Subminiature 1000-ohm potentiometer
S1—Spdt switch
S2—Spst switch
Misc.—Perforated board; IC sockets (optional); battery holder; small Bakelite or plastic case; machine hardware; hookup wire; solder; etc.