GENERATION OF 1-SEC. PULSES SPACED 5-SEC. APART

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This circuit using a dual-timer NE556 can produce 1Hz pulses spaced 5 seconds apart, either manually or automatically. IC NE556 comprises two independent NE555 timers in a single package. It is used to produce two separate pulses of different pulse widths, where one pulse initiates the activation of the second pulse.

The first half of the NE556 is wired for 5-second pulse output. When slide switch S2 is in position 'a', the first timer is set for manual operation, i.e. by pressing switch S1 momentarily you can generate a single pulse of 5-second duration. When switch S2 is kept in 'b' position, i.e. pins 6 and 2 are shorted, timer 1 in NE556 triggers by itself.

The output of the first timer is connected to trigger pin 8 of second timer, which, in turn, is connected to a potential divider comprising resistors R4 and R5. Resistor R1, preset VR1, resistor R2, preset VR2, and capacitors C2 and C5 are the components determining time period. Presets VR1 and VR2 permit trimming of the 5-second and 1-second pulse width of respective sections.

When switch S2 is in position 'a' and switch S1 is pressed momentarily, the output at pin 5 goes high for about 5 seconds. The trailing (falling) edge of this 5-second pulse is used to trigger the second timer via 0.1µF capacitor C6. This action results in momentarily pulling down of pin 8 towards the ground potential, i.e. 'low'. (Otherwise pin 8 is at 1/2 Vcc and triggers at/below 1/3 Vcc level.) When the second timer is triggered at the trailing edge of 5-second pulse, it generates a 1-second wide pulse.

When switch S2 is on position 'b', switch S1 is disconnected, while pin 6 is connected to pin 2. When capacitor C is charged, it is discharged through pin 2 until it reaches 1/3Vcc potential, at which it is retriggered since trigger pin 6 is also connected here. Thus timer 1 is retriggered after every 5-second period (corresponding to 0.2Hz frequency). The second timer is triggered as before to produce a 1-second pulse in synchronism with the trailing edge of 5-second pulse.

This circuit is important wherever a pulse is needed at regular intervals; for instance, in 'Versatile Digital Frequency Counter Cum Clock' construction project published in EFY Oct. '97, one may use this circuit in place of CD4060-based circuit. For the digital clock function, however, pin 8 and 12 are to be shorted after removal of 0.1µF capacitor and 10-kilo-ohm resistors R4 and R5. ❑