

Long pulse detector

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There are several applications, in which pulses longer than the set width are to be detected, ignoring the other short pulses. We are familiar with missing pulse detector circuit, which detects the occurrence of a missing pulse in a pulse train where pulses are of equal duration. But this circuit detects the long pulses in a pulse train whose pulses need not be of equal duration. Circuit outputs the pulses which are longer than the set width. This output can be counted or taken for further action as needed.

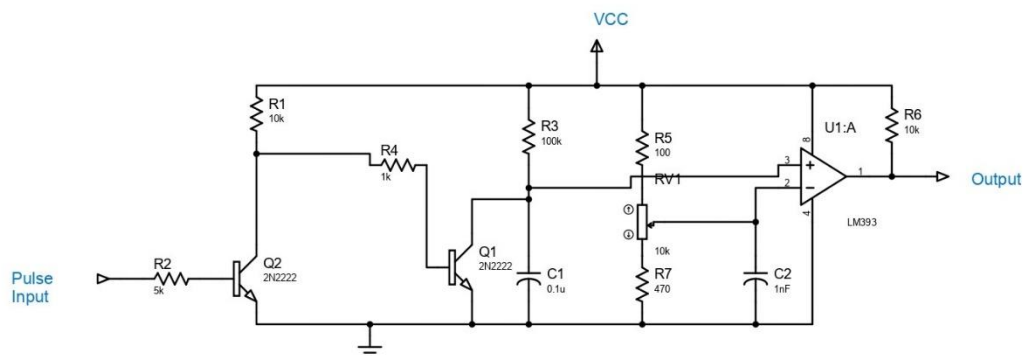


Fig 1: Circuit detects the long pulse whose width is decided by RV1's setting. Long pulse alone will be outputted. Other short pulses will not come to the output. See text for RV1 potentiometer setting.

During OFF durations of pulse train, capacitor C1 is shorted by Q1 making the capacitor voltage as zero. Comparator LM393 output becomes zero. During ON duration of pulse train, capacitor C1 charges, whose instantaneous voltage is given by;

$$V = V_{cc} (1 - e^{-t/R3C1})$$

Calculate the value of v corresponding to the long pulse duration. Set the potentiometer voltage at the wiper to this value. For shorter pulses, the

capacitor voltage will be $< v$, hence comparator outputs zero. For long pulse, the capacitor charge voltage will be $> v$, hence comparator outputs High. Thus we get pulses at comparator output whenever input pulse widths are exceeding the required pulse width, as set by potentiometer set voltage v .

Fig !'s circuit values are designed to track pulses of duration longer than 2 m.sec ,as an example. As per the above charge equation, v comes to 0.9 volt for pulse width of 2 msec. Potentiometer VR1 is set at 0.9 V. For longer pulses, the capacitor charge voltage will be more than 0.9Volt and comparator will output High, indicating the arrival a long pulse.