

Triangular Wave Generator Using Op-Amp

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Theory:

Triangular waves are periodic, non-sinusoidal waveform with a triangular shape. A triangular wave is that it has equal rise and fall times while a sawtooth wave has unequal rise and fall times. To generate a triangular waveform, a square wave is passed through an integrator.

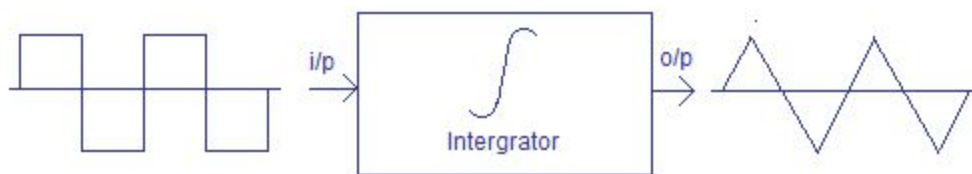


Figure: Generation of Triangular Waveform

Hence the main part of the circuit consist of:

1. A square wave generator
2. An integrator which converts the square wave to a triangular waveform.

Schematic Diagram:

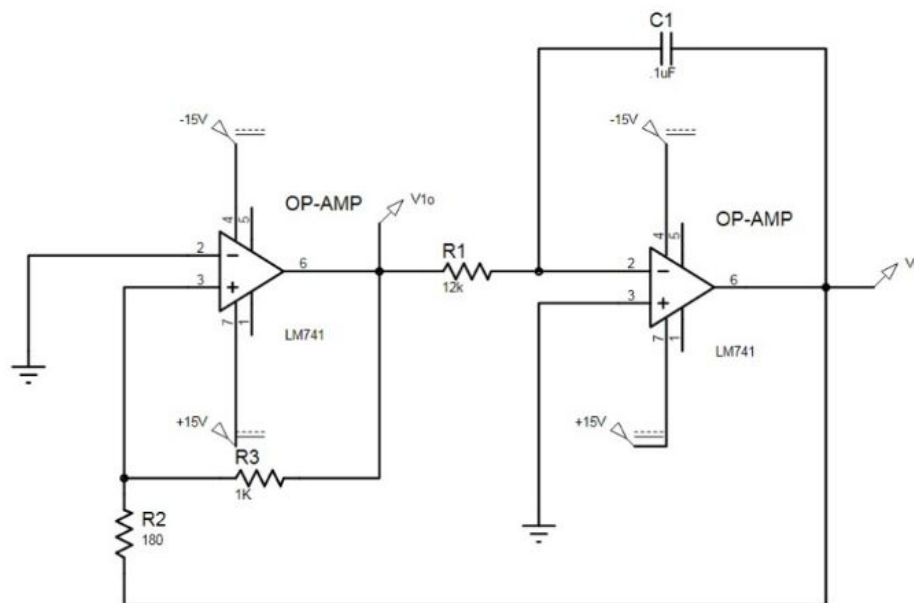


Figure: Circuit Diagram

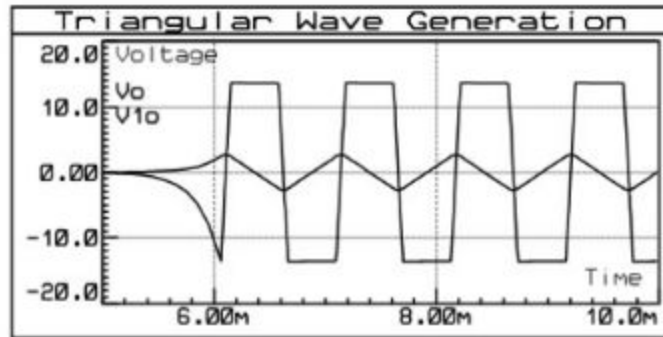


Figure: Expected Waveform

Design:

First op-amp acts as a comparator and the second op-amp acts as an integrator.

$$f = \frac{1}{4R_2R_3C}$$

Peak to peak amplitude of the ramp, $V_{opp} = 2 \left(\frac{R_2}{R_1} \right) V_{sat}$

Reference:

<http://www.circuitstoday.com/triangular-wave-generator>