

Assignment 4

15.50 The saturated output voltages of the comparator in Figure P15.50 are $\pm 10\text{ V}$. (a) Find R_x such that the frequency of oscillation is 500 Hz when the potentiometer is connected to point A. (b) Using the results of part (a), determine the oscillator frequency when the potentiometer is connected to point B.

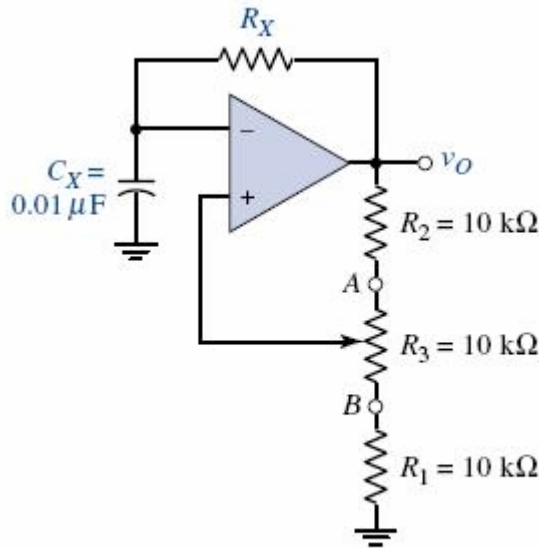


Figure P15.50

D15.53 Figure 15.43 shows the 555 timer connected in the monostable multivibrator mode. (a) Design the circuit to provide an output pulse 60 seconds wide. (b) Determine the recovery time.

D15.54 Design a 555 monostable multivibrator to provide a $5\ \mu\text{s}$ pulse. What is the recovery time?

15.55 A 555 timer is connected in the astable mode as shown in Figure 15.44. The parameters are $R_A = R_B = 20\ \text{k}\Omega$ and $C = 0.1\ \mu\text{F}$. Determine the frequency of oscillation and the duty cycle.

15.56 A 555 ICC is connected as shown in Figure P15.56. Determine the range of oscillation frequency and the duty cycle.

15.57 Repeat Problem 15.56 for the circuit in Figure P15.57.

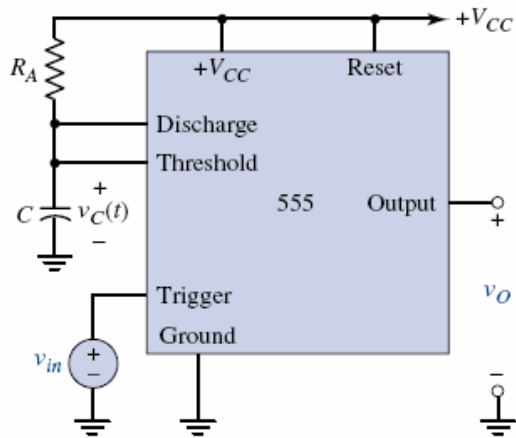


Figure 15.43 The 555 circuit connected as a monostable multivibrator

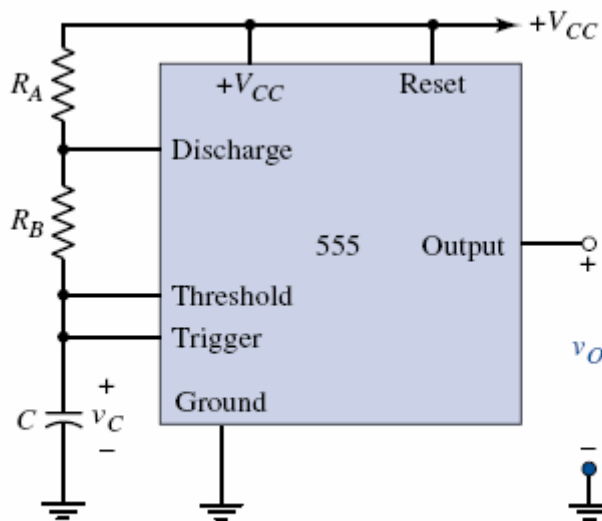


Figure 15.44 Astable multivibrator 555 circuit

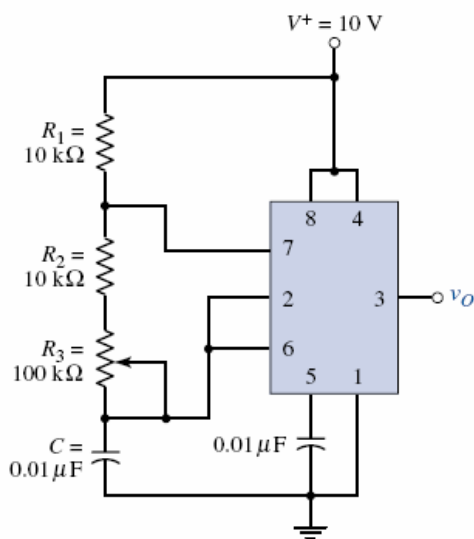


Figure P15.56

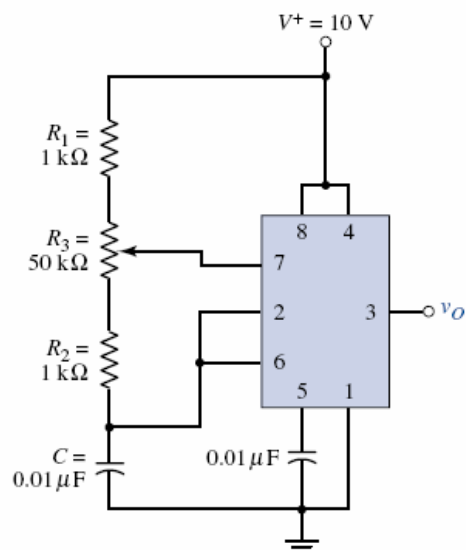


Figure P15.57