

Problem

A 1000- μF capacitor and a 470- μF capacitor are arranged in the circuit shown in Figure 1, with a 10-V DC supply. Initially, the switch is at position B then thrown to position A, and then thrown to position B, and then to position A, and finally to position B.

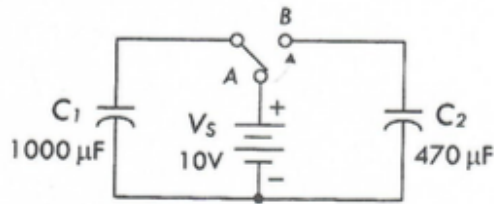
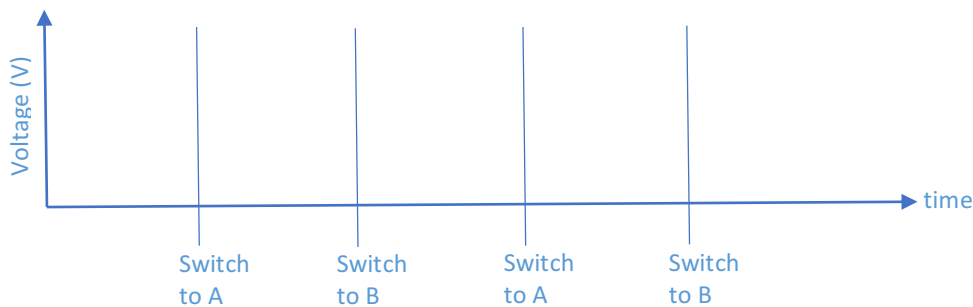


Figure 1

Assuming the capacitors have enough time to fully charge or discharge during the interval between switches:

1. what is the final voltage across each capacitor after the last switch takes place?
2. plot the voltages V_1 and V_2 across the capacitors during the four switching intervals.



3. To convince yourself of the correctness of your answers model the circuit with either LTSPICE or HSPICE. Please, attach 1) SPICE deck and 2) plot of V_1 and V_2 vs. time (make sure use a white background).

Hint:

To model the switching pattern described use a voltage controlled switch

- a. For LTSPICE examples on how to work with voltage controlled switches see <http://www.linear.com/solutions/5735>
- b. For HSPICE examples on how to work with voltage controlled switches see “Modeling switches” in *HSPICE User Guide: Basic Simulation and Analysis*.