



Experiment 3 Instruction

Dawei Zhong
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KAP-B11

Make the curve
measurement
precise by
adjusting the
number in Part
G, using 2ms

Introduction & Tips

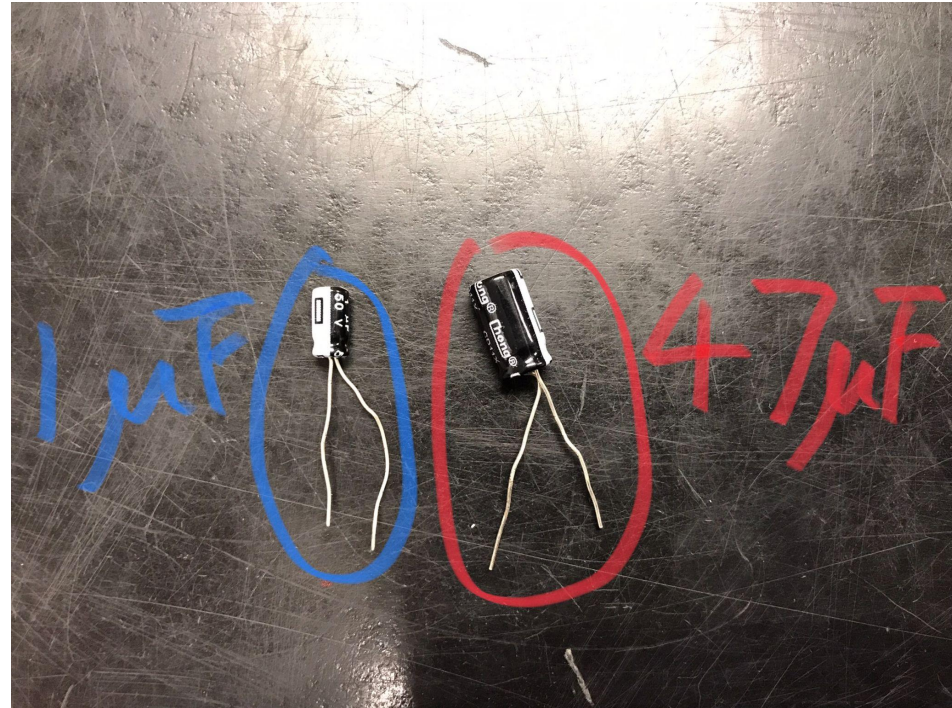
- **About:** In this lab, you need to study capacitors
- **Tips:**
 - Read the lab PDF and this instruction together to figure out how to do the lab
 - You are required to take photos in Task D and G, and analyze data in the photo, don't forget that



Hope it helps

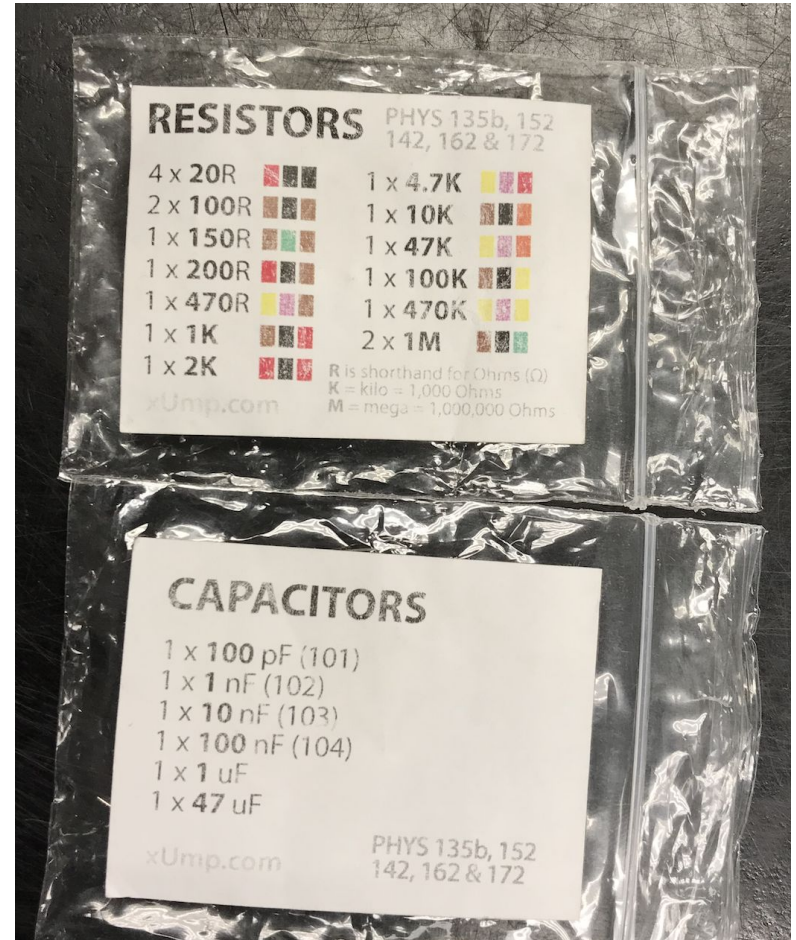
Preparation

- **Capacitor:** Here is the capacitor you might mainly use in today's lab



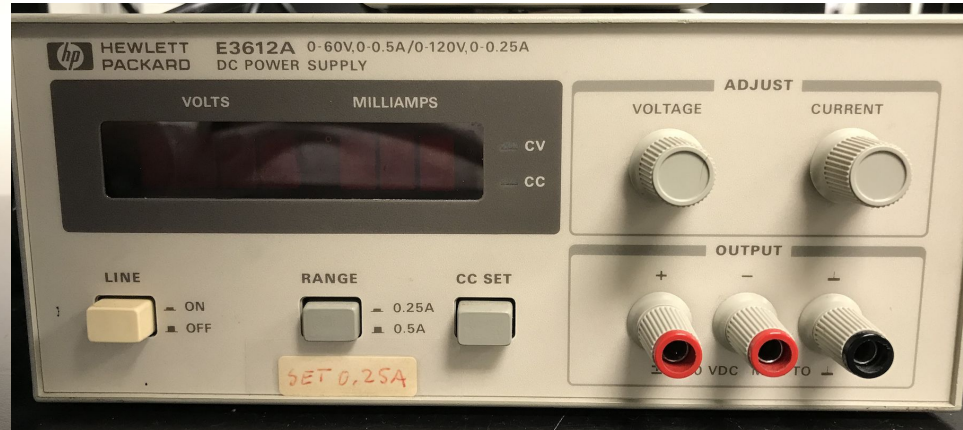
Preparation

- **Capacitor and Resistor:** Here is the capacitor and resistor you might mainly use in today's lab



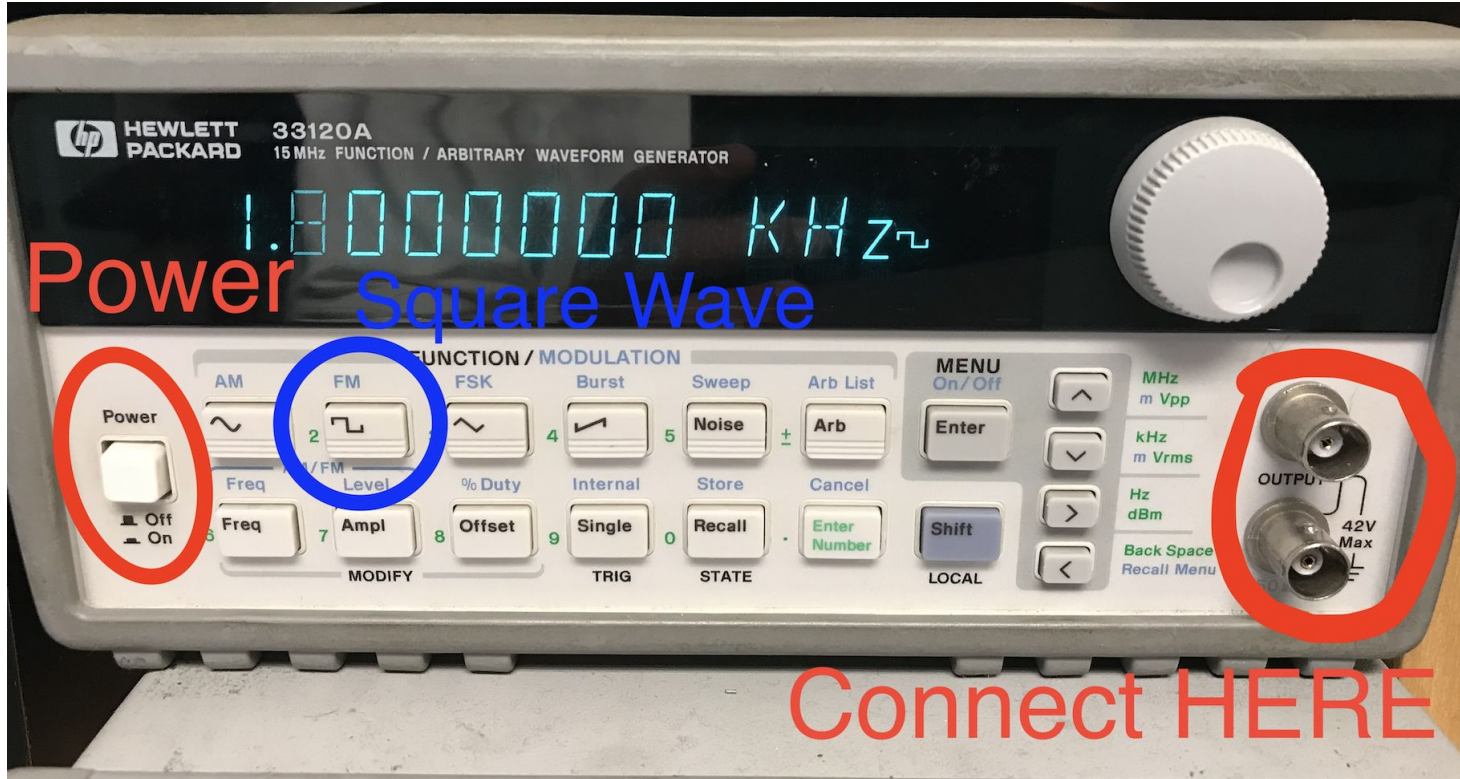
Preparation

- **DC Power Supply:** You will use it from Part A to Part E instead of battery. Use CV mode (constant voltage)



Preparation

- Wave generator: You will use it in Part F and Part G



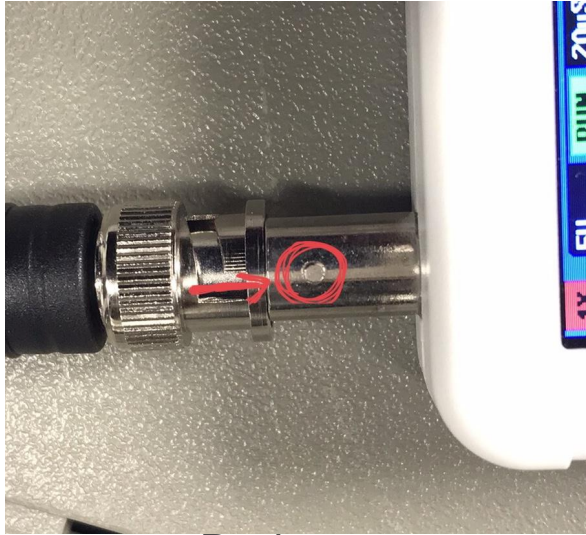
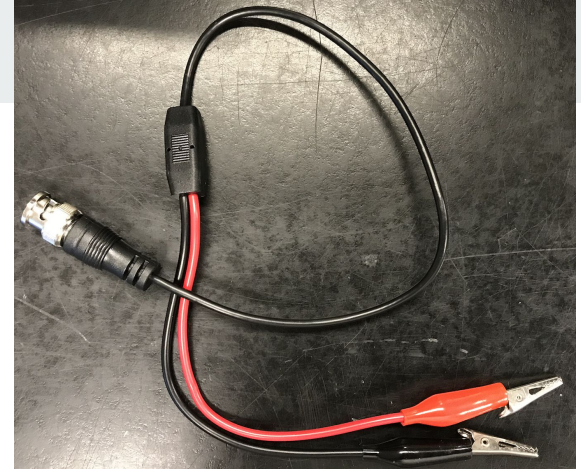
Preparation

- **Oscilloscope:** You will use it from Part C to Part G

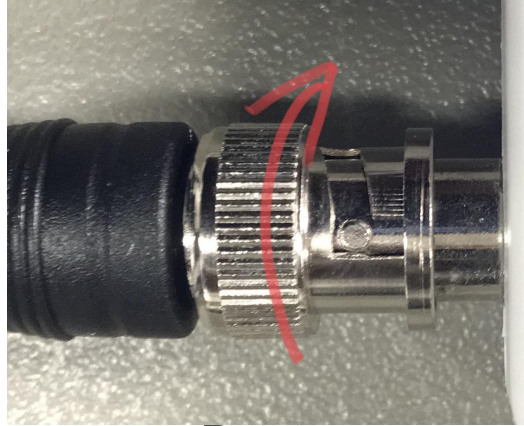


Preparation

- Connect Wave generator and Oscilloscope:



Push



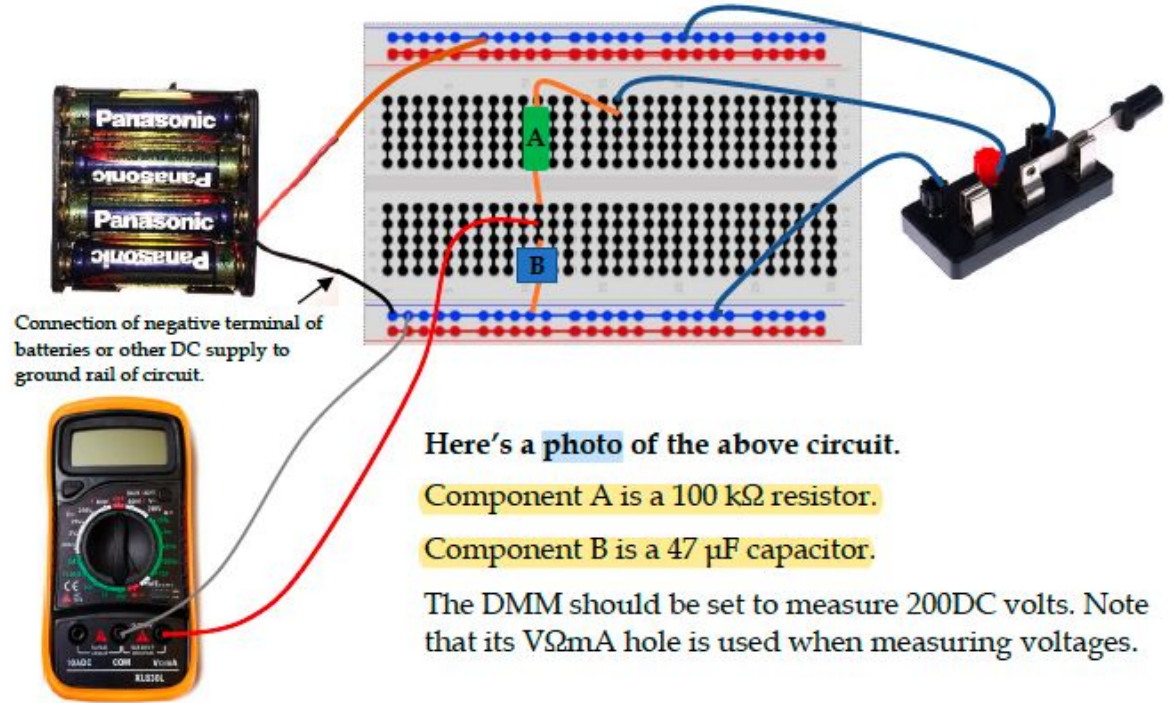
Rotate



Done

Part A - Task A, B in the Report

- Measure half charging/discharging time:
 - Step 1: Connect the circuit as shown, set voltage as 6V
 - Use the 200V scale of DMM

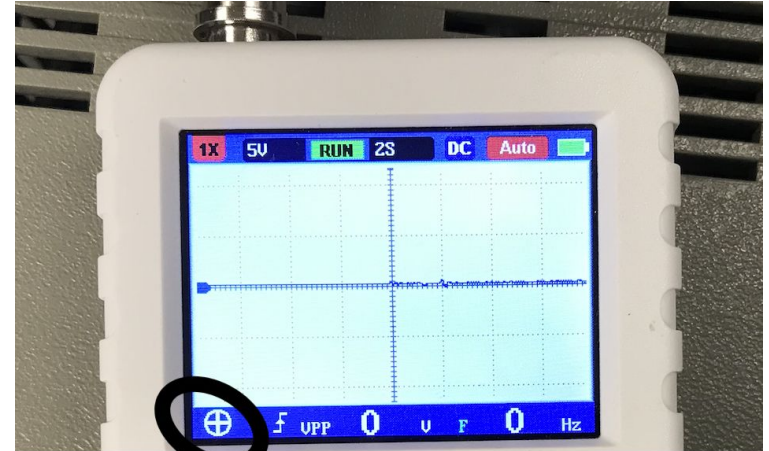


Part A - Task A, B in the Report

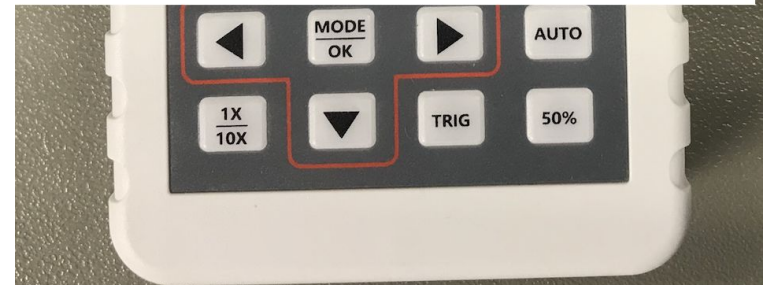
- **Measure half charging/discharging time:** Use your stopwatch in your mobile phone
 - Step 1: ...
 - Step 2: Charge the capacitor and find its fully charged voltage U
 - Step 3: Use stopwatch in your phone, measure the time
 - From 0 to $0.5 \cdot U$
 - From U to $0.5 \cdot U$
 - Repeat step 3 for two or three times, get average charging/discharging time
 - Compare with calculation

Part B - Task C, D and E in the Report

- Measure half charging/discharging time:
 - Step 1: Set your scope



Step1: Press “Mode”
until you see this



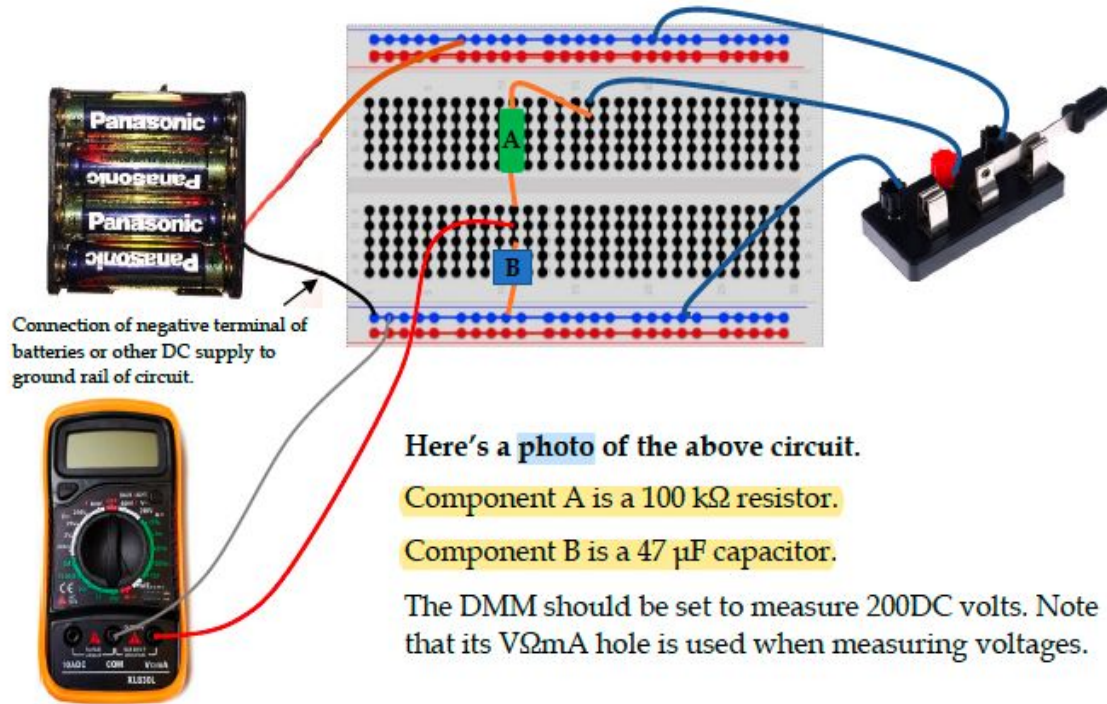
Part B - Task C, D and E in the Report

- Measure half charging/discharging time:
 - Step 1: Set your scope (2V and 2S or 5V and 2S)



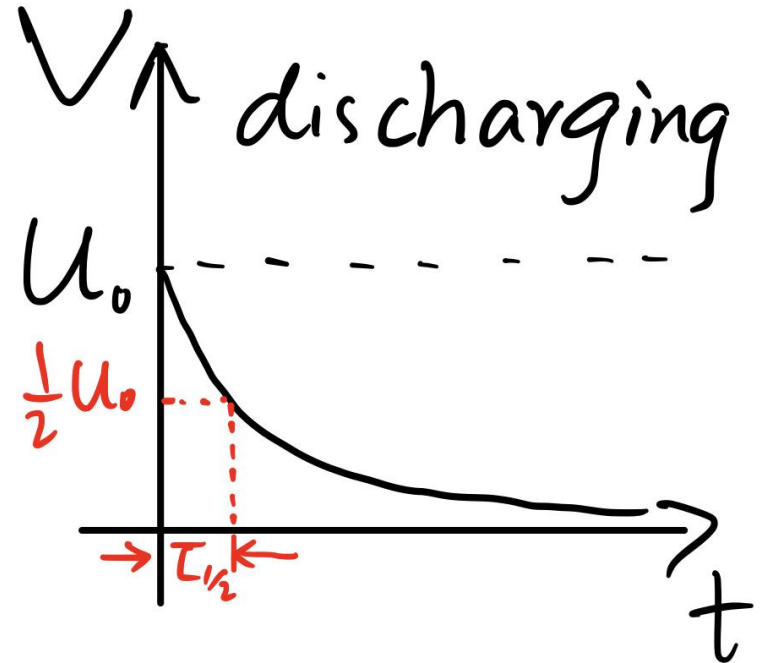
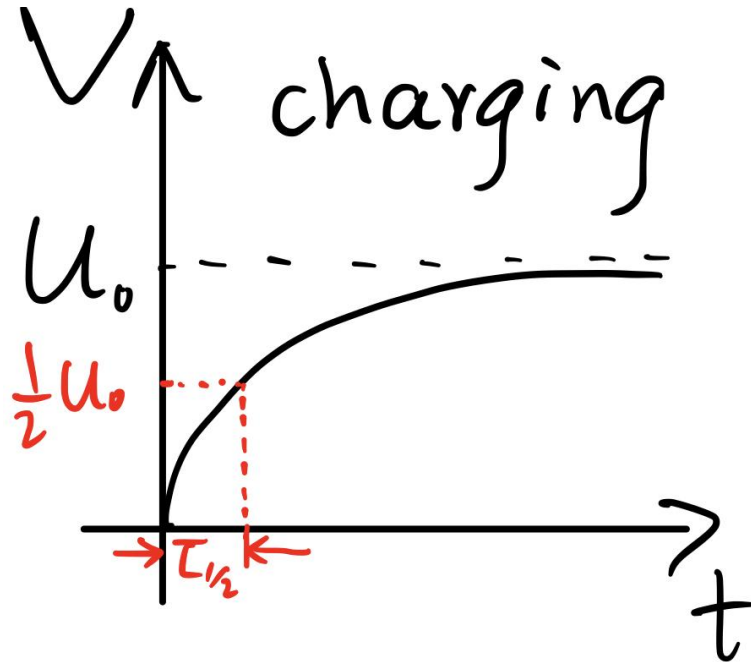
Part B - Task C, D and E in the Report

- Measure half charging/discharging time:
 - Step 1: ...
 - Step 2: Connect circuit as shown, set voltage as 6V, replace DMM with scope
 - Step 3: Press “STOP” when you get your curve, take photo



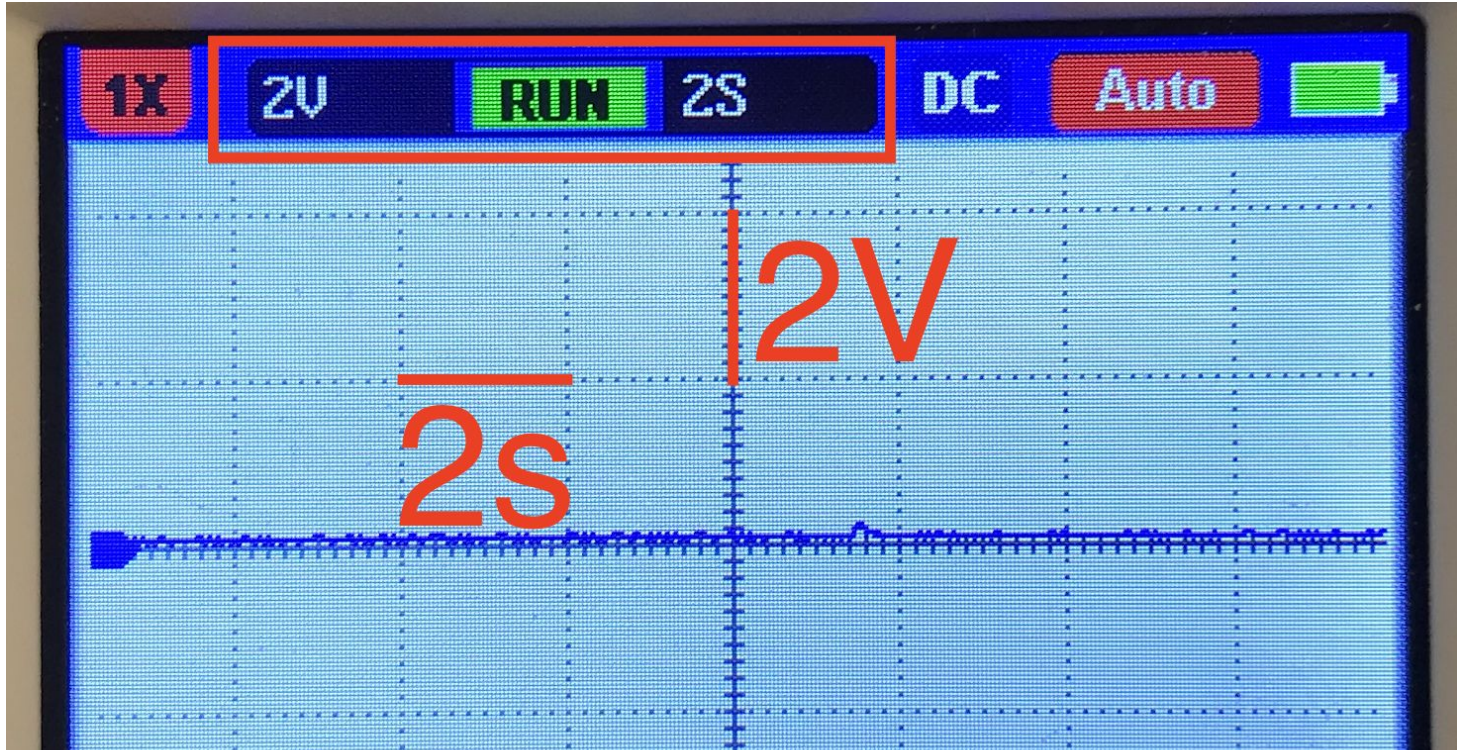
Part B - Task C, D and E in the Report

- Measure half charging/discharging time:
 - What you will get from scope and how you do measurement



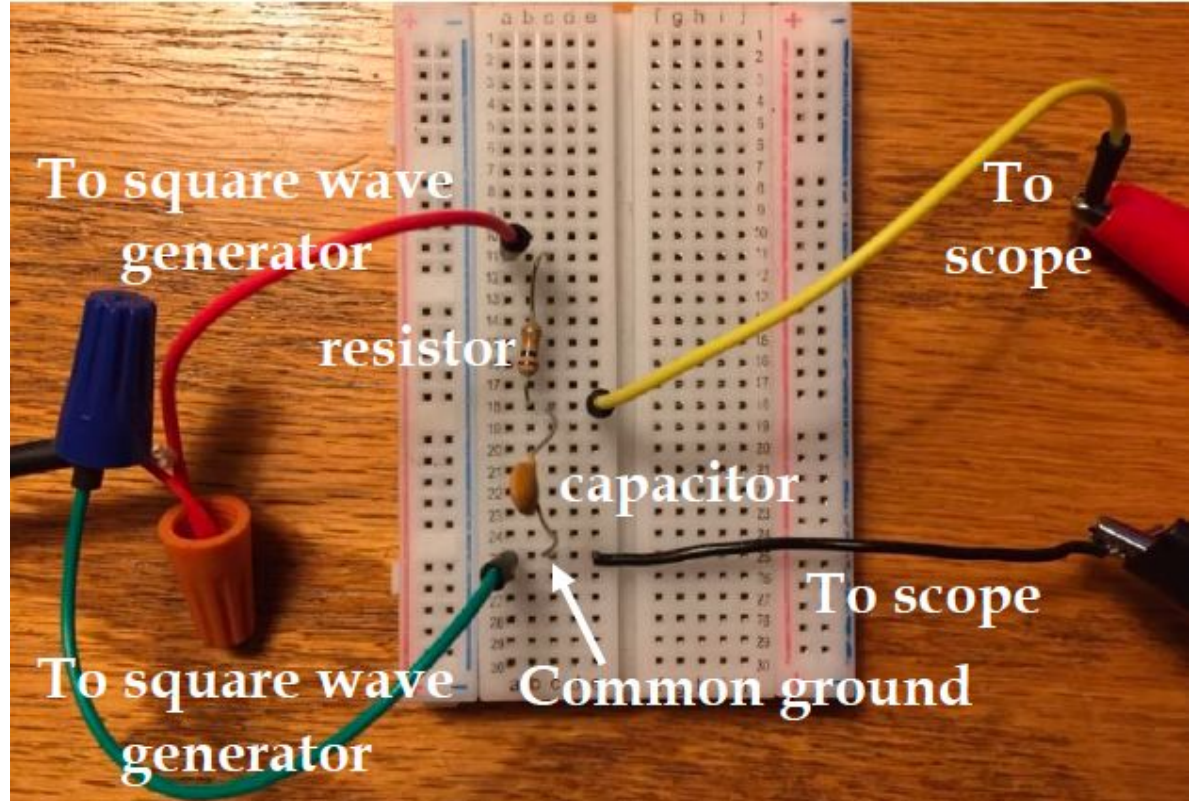
Part B - Task C, D and E in the Report

- Measure half charging/discharging time:
 - For example, if you set 2V and 2s, here is what they means
 - Note that we have 10 small ticks in one big tick



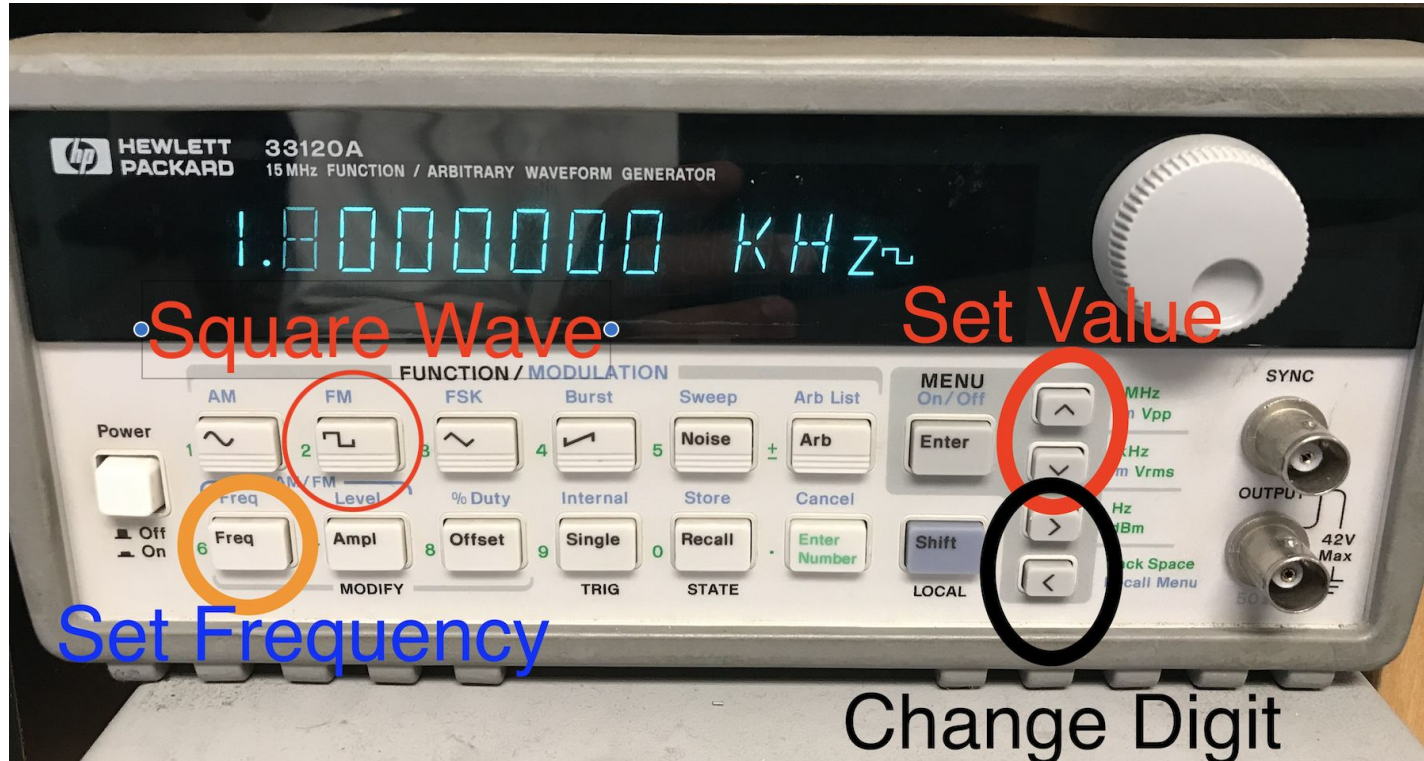
Part C - Task F, G and H in the Report

- Measure half charging/discharging time:
 - Step 1: Connect circuit as shown
 - Use $R = 1\text{k}\Omega$ and $C = 1\mu\text{F}$, or $R = 2\text{k}\Omega$ and $C = 1\mu\text{F}$, or any other such that RC is ~ 0.001



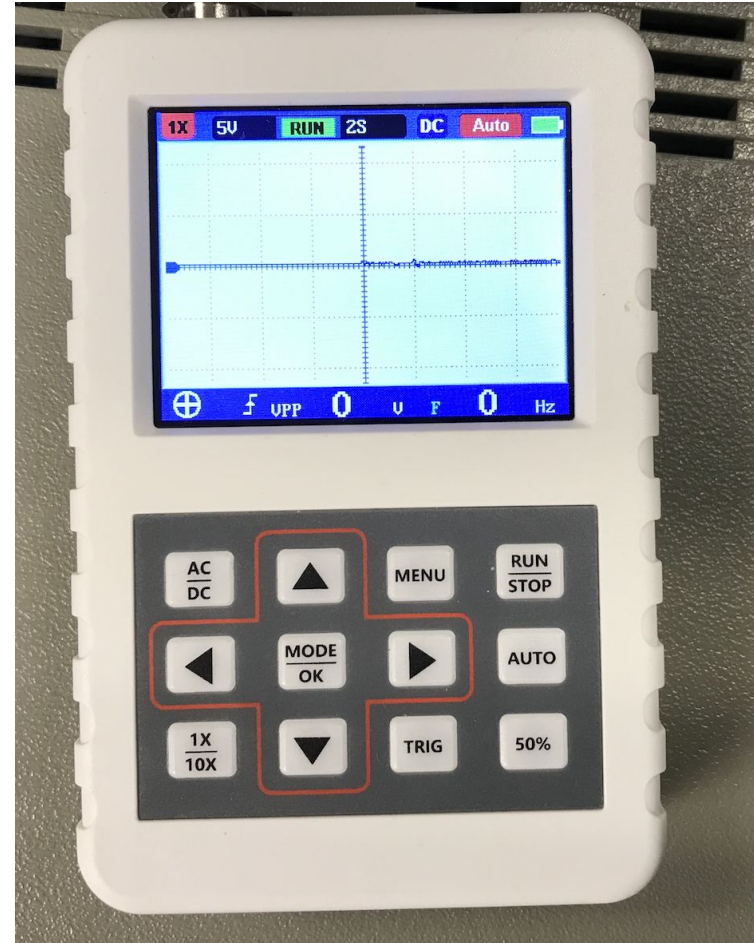
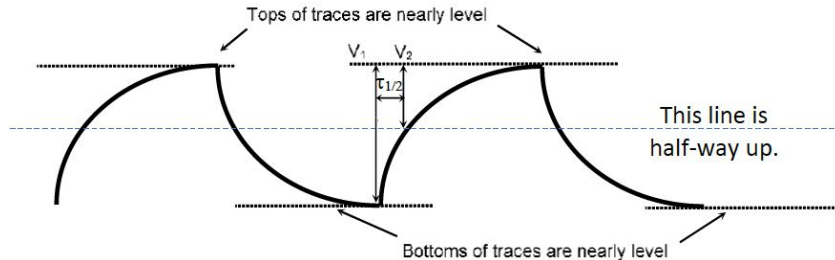
Part C - Task F, G and H in the Report

- Measure half charging/discharging time:
 - Step 1: Connect circuit as shown
 - Set Wave Generator as square wave, 100 Hz



Part C - Task F, G and H in the Report

- Measure half charging/discharging time:
 - Step 1: ...
 - Step 2: Press "AUTO" and you will see the pattern:



Analysis part

- **About:** In this lab, you need to study capacitors
- **Tips:**
 - Follow Part A to Part H in the PDF and finish all questions. Remember to put your photo in your lab report
 - Write down the capacitor and resistance you use in each part



Hope it helps