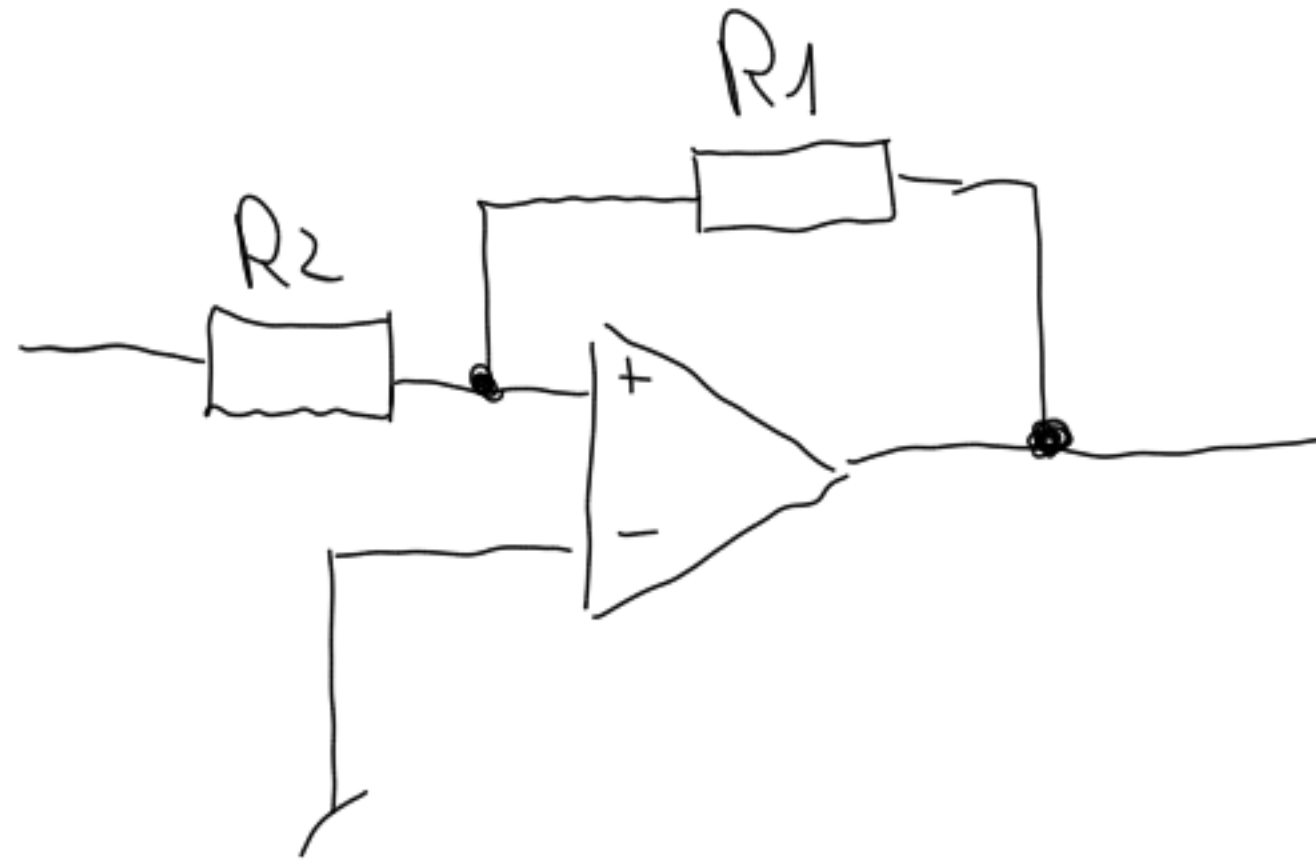


$R_1 = 100k\Omega$
 $R_2 = 10k\Omega$

> faible hystérèse



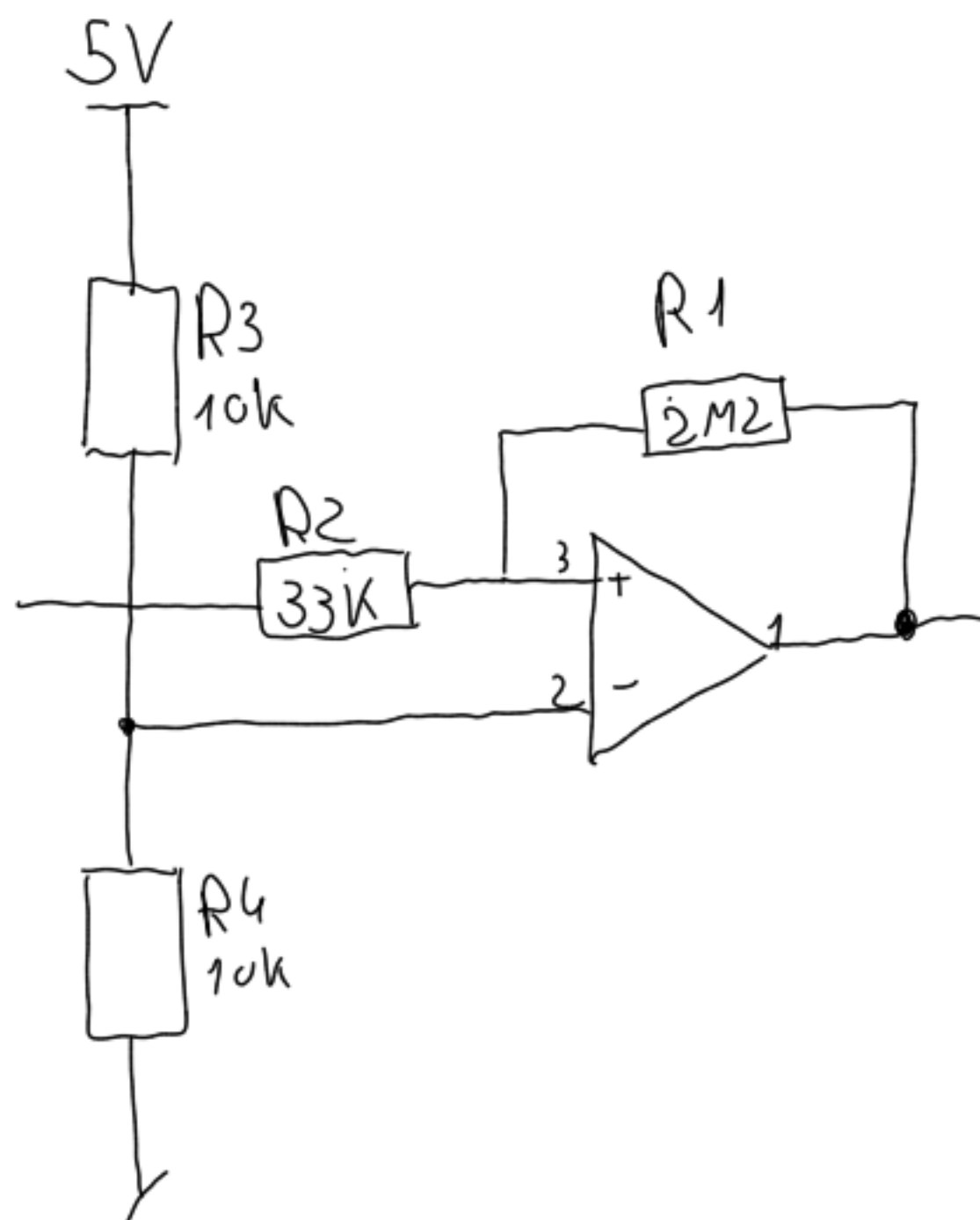
$R_1 = 10k\Omega$
 $R_2 = 10k\Omega$

> hystérèse modérée

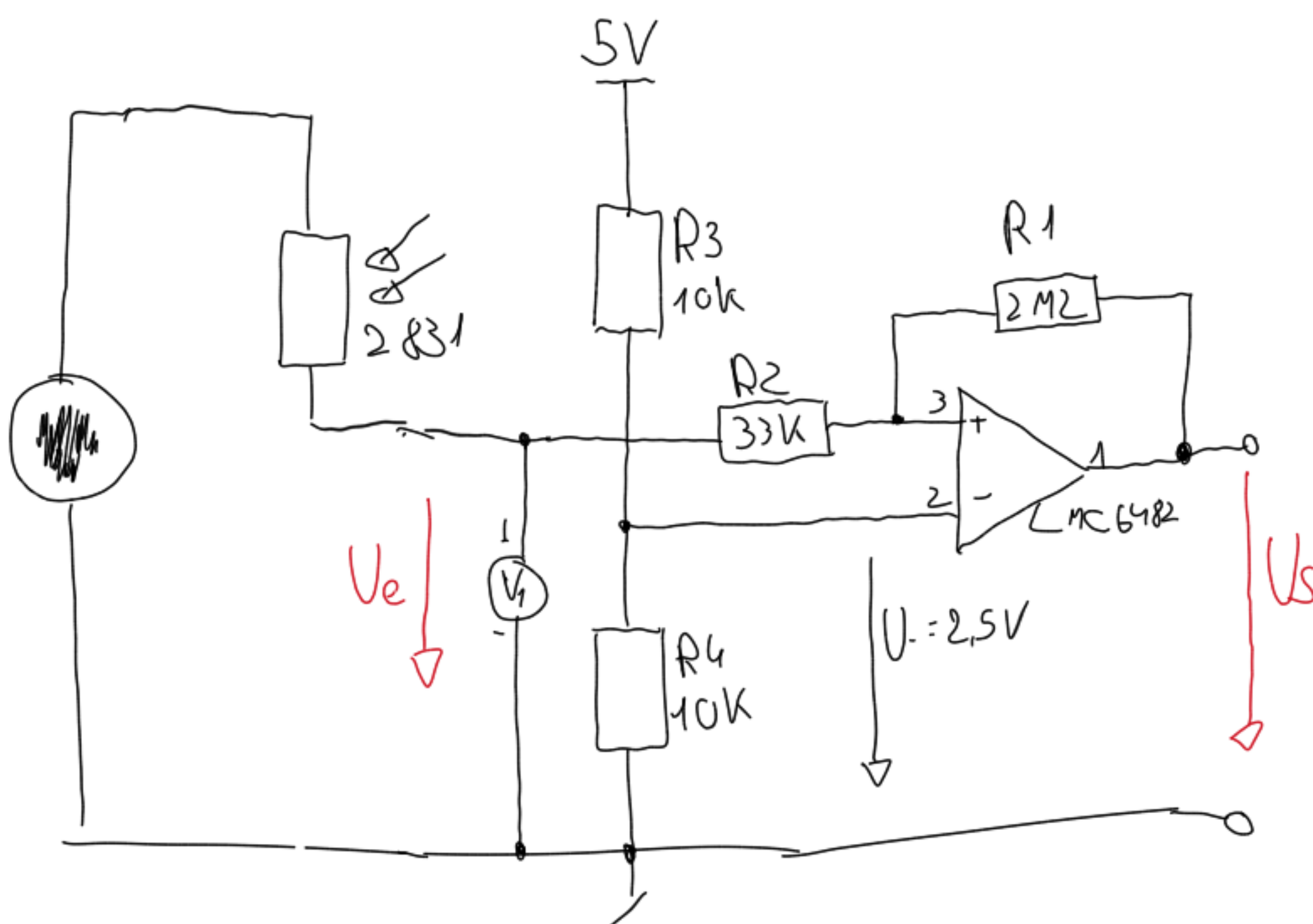
$R_1 = 10k\Omega$
 $R_2 = 100k\Omega$

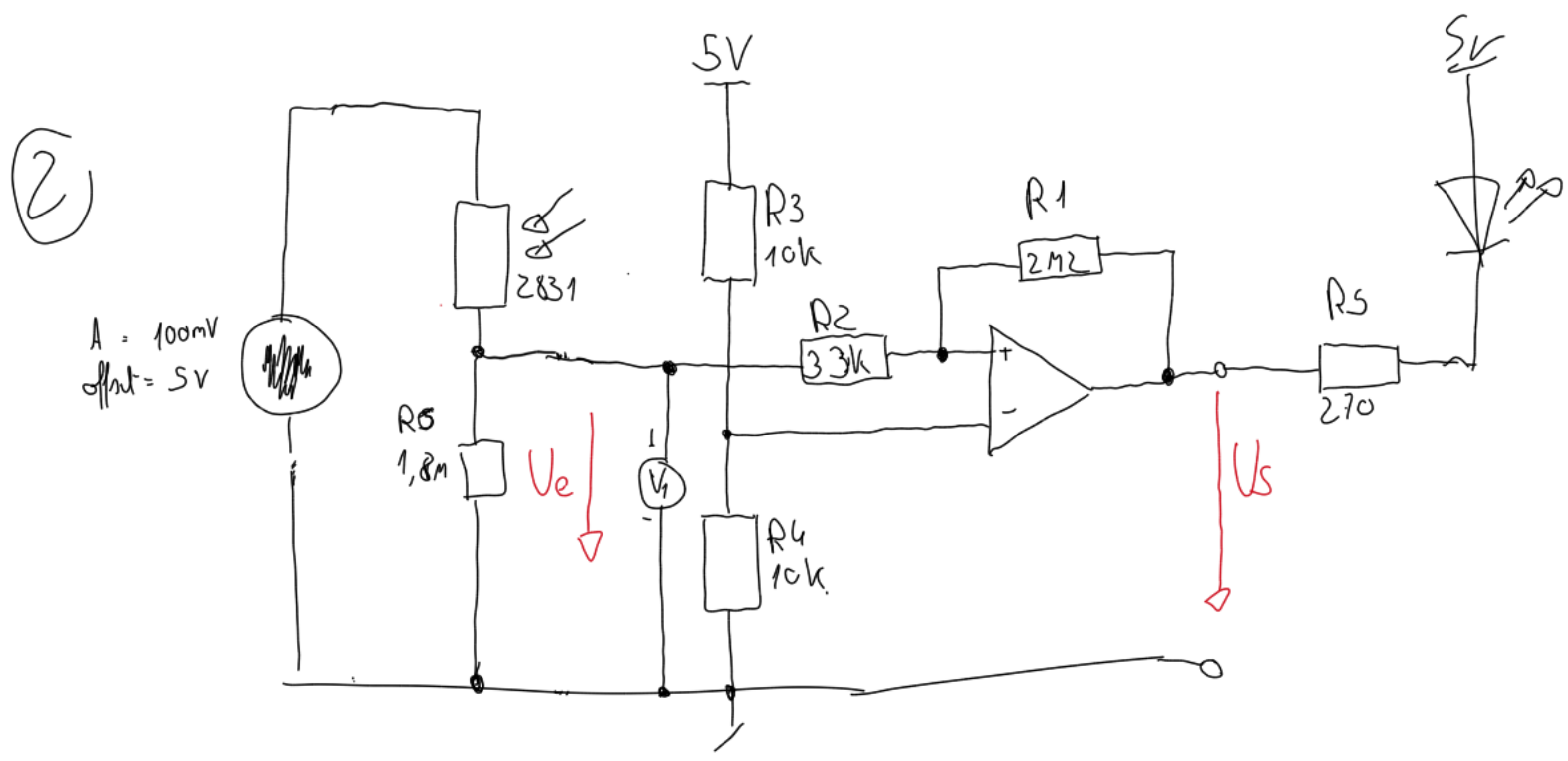
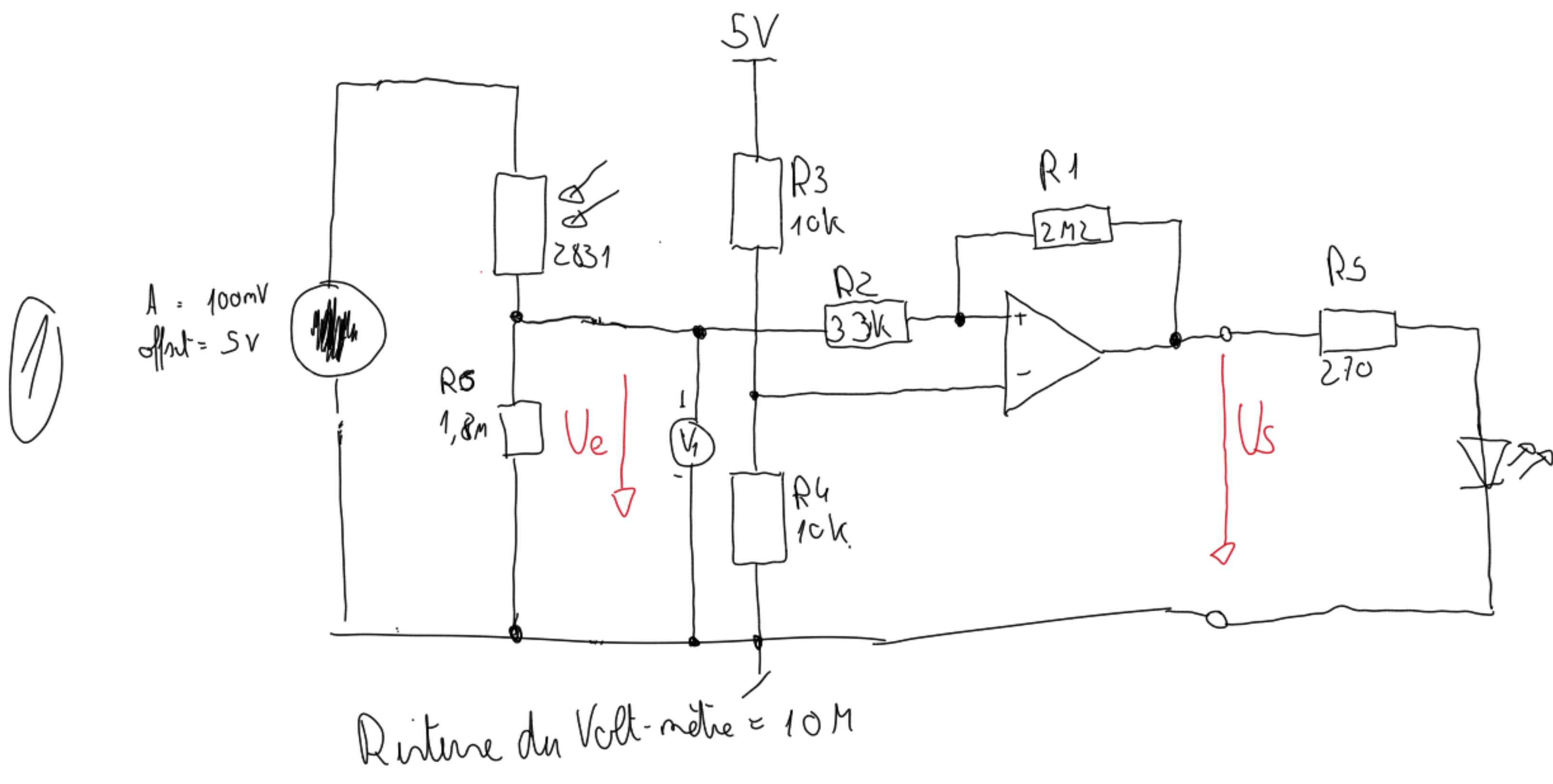
> forte hystérèse

$U_- = 2,5V$



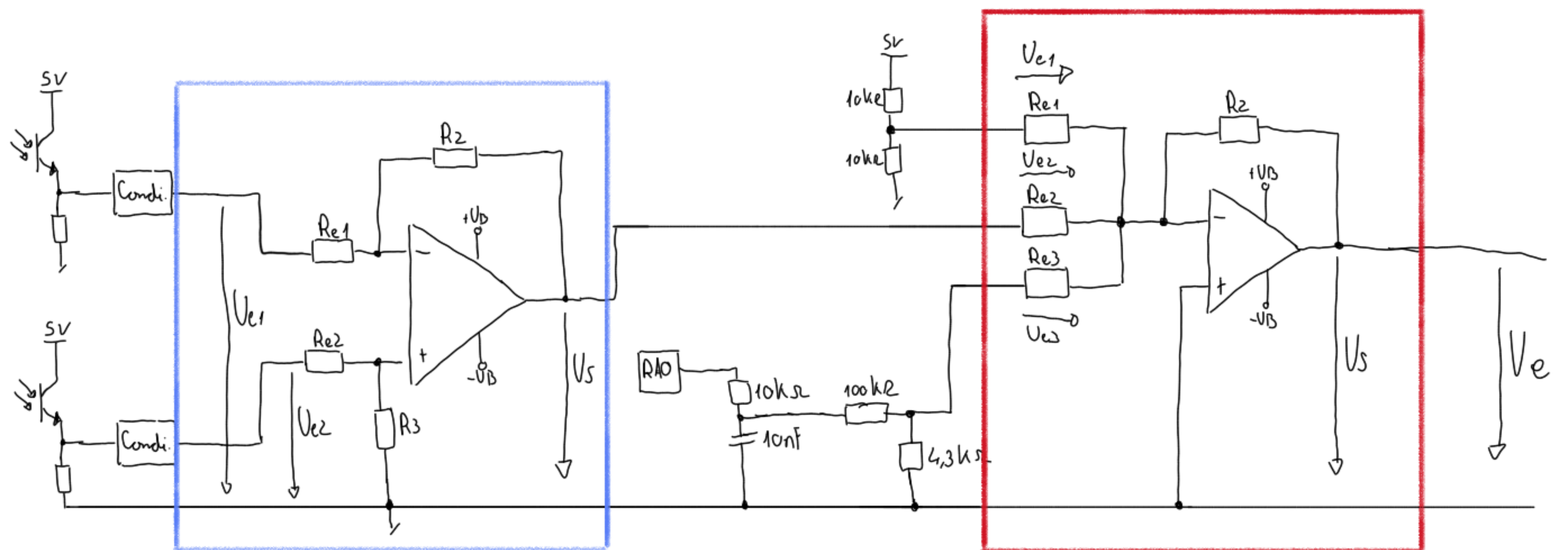
Noise
 $A = 100mV$
 $offset = 5V$





② = plus réaliste que le ①

X fausse bonne idée.



Soustracteur

$$A_{ve1} = \frac{R_2}{R_{e1}}$$

$$A_{ve2} = \frac{1 + \frac{R_2}{R_{e1}}}{1 + \frac{R_{e2}}{R_3}}$$

$$V_s = (V_{e2} \cdot A_{ve2}) - (V_{e1} \cdot A_{ve1})$$

$$\text{Si } R_2 = R_3 \text{ // } R_{e1} = R_{e2}$$

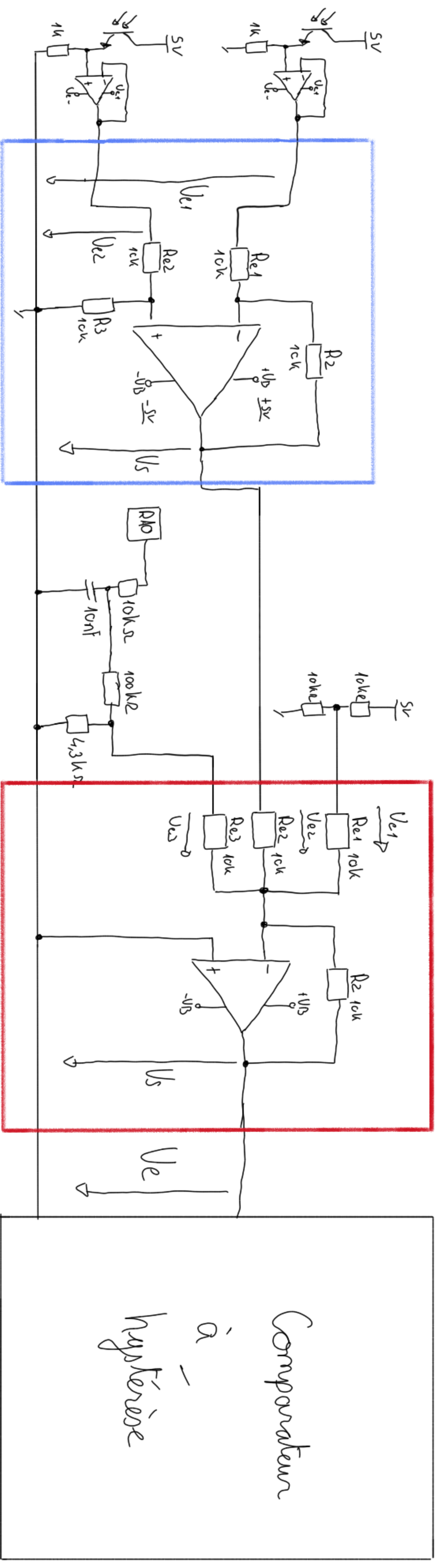
$$V_s = \frac{R_2}{R_{e1}} \cdot (V_{e2} - V_{e1})$$

Additionneur

$$-V_s = R_2 \left(\frac{V_{e1}}{R_{e1}} + \frac{V_{e2}}{R_{e2}} + \frac{V_{e3}}{R_{e3}} \right)$$

$$\text{Si } R_{e1} = R_{e2} = R_{e3}$$

$$-V_s = V_{e1} + V_{e2} + V_{e3}$$



à
Comparteur
hystérie

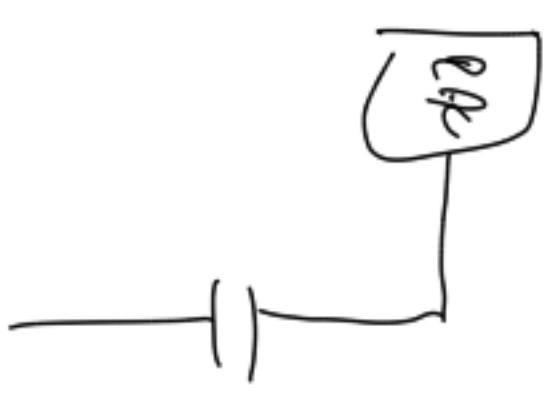
$$f_c \approx 50 \text{ Hz}$$

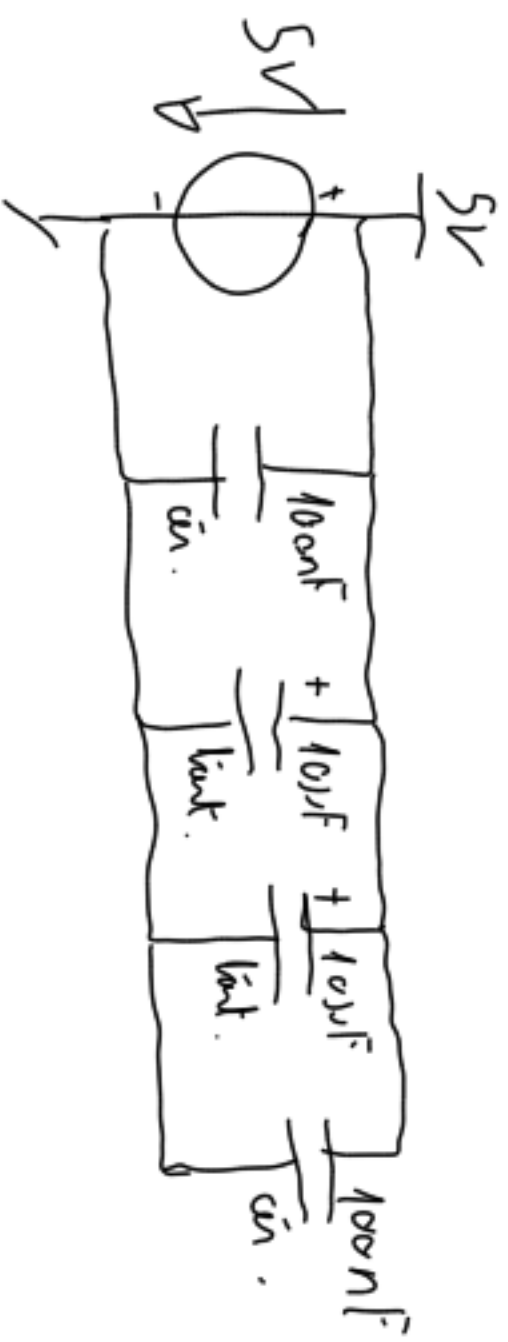
$$f_c = \frac{1}{2\pi RC}$$

ordre de 100 Hz
→ meilleur rendu est à 50 kHz

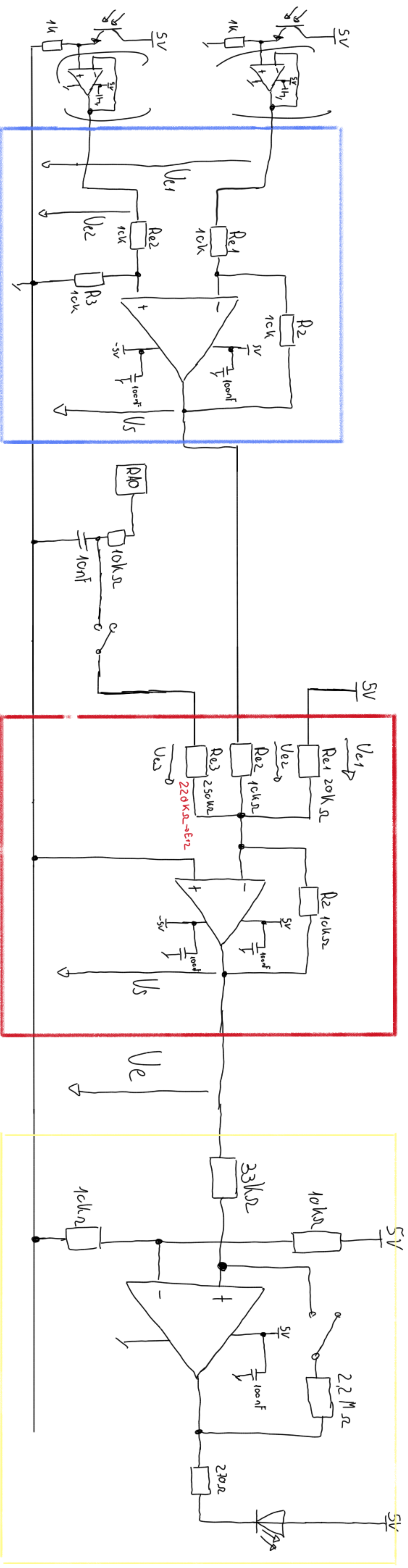
$$C = \frac{1}{2\pi R f} = 66 \text{ nF} \rightarrow \text{trop petit}$$

$$\rightarrow \times 10 \rightarrow \underline{\underline{660 \text{ nF}}}$$





mettre l'impédance de R et P pour R_{e2}



Sourceur

SMD

Additionner

SMD

Comparateur à hystérèse

THI

$$\frac{5V}{200mV} = \underline{\underline{25}}$$

$$\text{Si } R_2 = \underline{\underline{10k\Omega}}$$

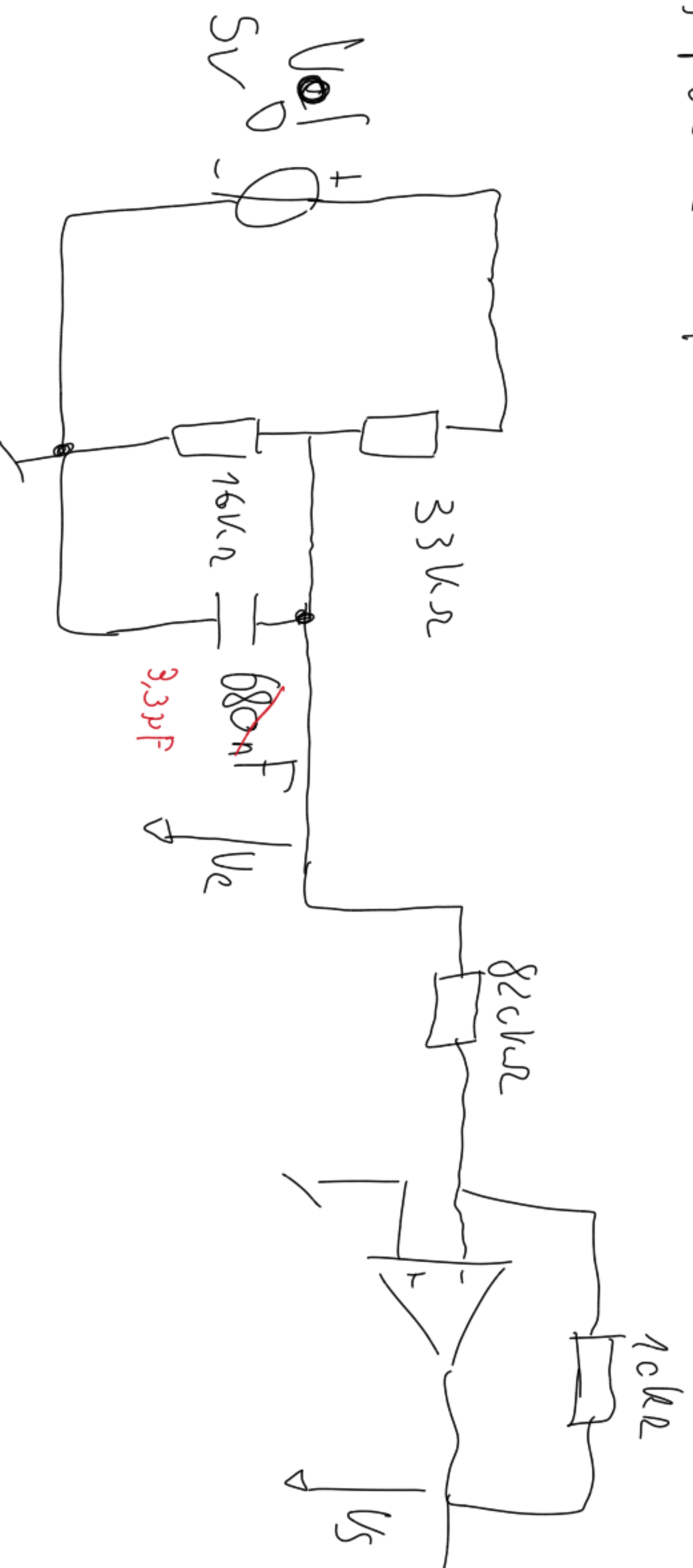
$$\text{alors } R_{e3} = R_2 \cdot 25 = \underline{\underline{250k\Omega}}$$

$$\frac{5V}{2,5V} = \underline{\underline{2}}$$

$$\text{Si } R_2 = \underline{\underline{10k\Omega}}$$

$$\text{alors } R_{e1} = R_2 \cdot 2 = \underline{\underline{20k\Omega}} \xrightarrow{E12} 22k\Omega$$

Apriori messure il faut $\sim 50k\Omega$ avec $680nF$



$$g_v = \frac{-10k\Omega}{82k\Omega} = -12,19mV/V$$

$$T = R \cdot C = 50k\Omega \cdot 680nF = \underline{34ms}$$

$$C = \frac{T}{R} = \frac{34ms}{10k/133k} = 3,16\mu F \Rightarrow \underline{3,3\mu F}$$

$$U_e = U_0 \cdot \frac{16k\Omega}{16k\Omega + 33k\Omega} = 1,63V$$

U_s doit etre en $\sim 20mV$

$$U_s = U_e \cdot g_v = 1,63V \cdot (-12,19mV/V) = \underline{\underline{-19,91mV}}$$