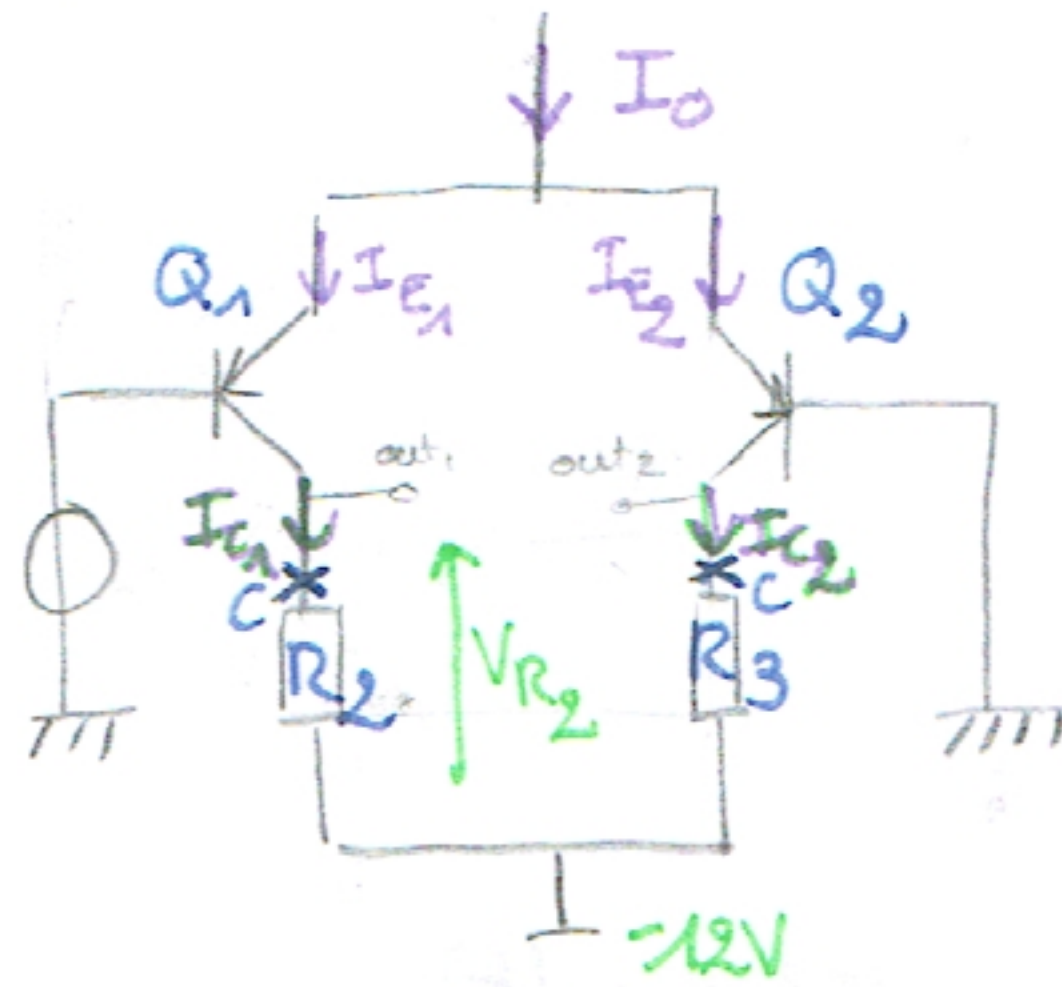


TP2 = Etage différentiel.Partie 1: Analyse et dimensionnement

1/

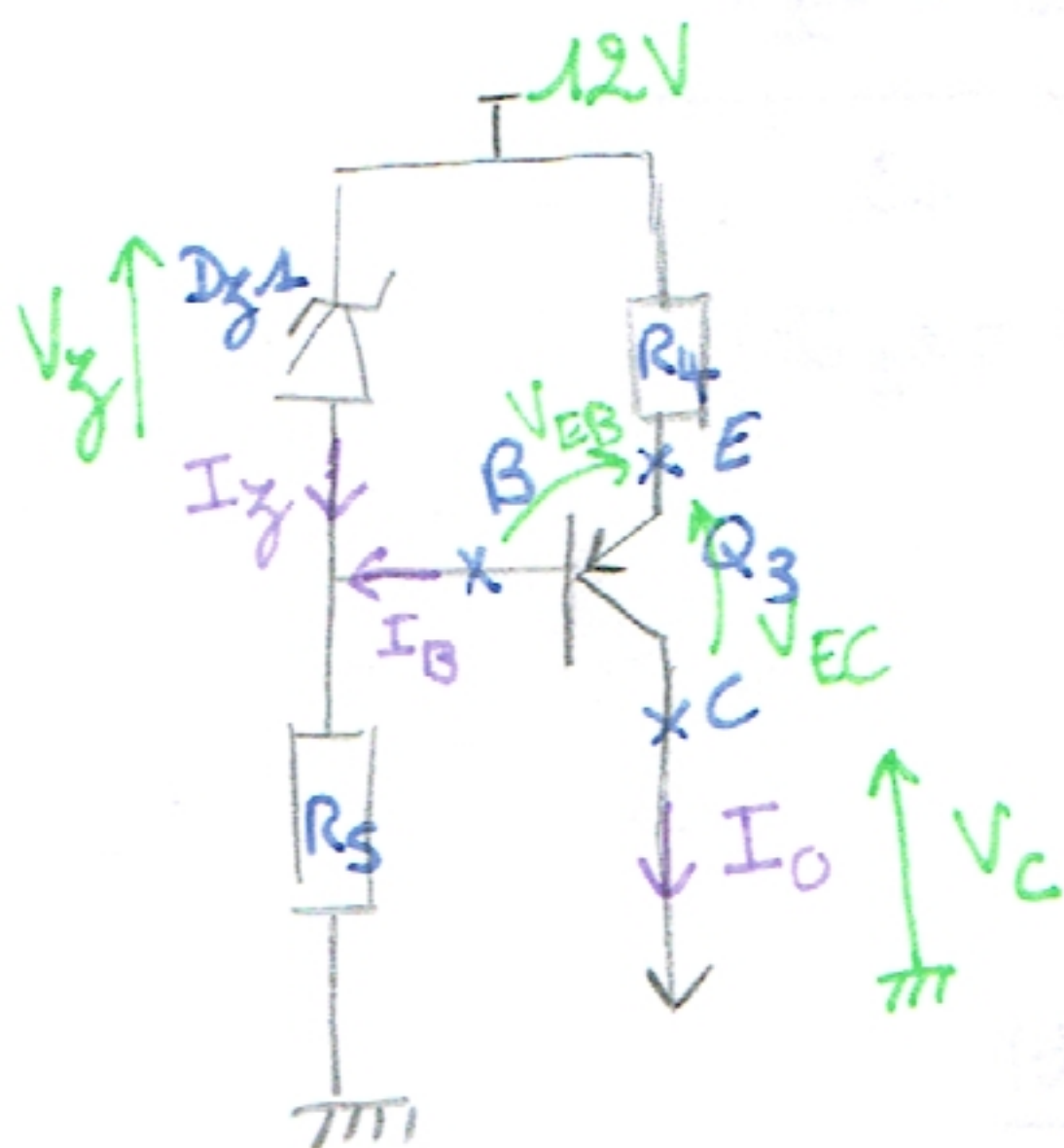


$$Q_1 = Q_2 = 2N2907.$$

$$I_{C1} = I_{C2} \Rightarrow R_2 = R_3.$$

$$V_{R2} = V_{R3} = 1,8V.$$

2/



= polarisation par diode zéner

 \Rightarrow générateur de courant au collecteur constant.

$$3/ \quad I_0 = I_C = 280 \mu A \quad Q_3 = 2N2907$$

$$V_Z = 5,1V$$

$$V_{EB} = 0,6V$$

$$V_{EC_{sat}} = 0,2V. \quad \beta = 100$$

$$I_Z = 5mA.$$

$$\Rightarrow V_{EC_{min}} = 0,5V$$

$$* I_{R5} = I_B + I_Z = \frac{I_C}{\beta} + I_Z = 5mA.$$

\nwarrow négligeable

$$\Rightarrow R_5 = \frac{V_{R5}}{I_{R5}} = 1380 \Omega$$

$$* V_{R5} = 12 - V_Z = 6,9V.$$

$$* I_{R4} = I_E \approx I_0 = 280 \mu A.$$

$$* V_{R4} = 12 - V_{R5} - V_{EB} = 4,5V$$

$$\Rightarrow R_4 = \frac{V_{R4}}{I_{R4}} = 18k\Omega.$$

$$4/ \quad V_{C_{max}} = 12 - V_{EC_{min}} - V_{R4} = 7V.$$

$$5/ \quad * V_{R2} = 1,8V \quad * I_{R2} = I_{C1} = I_0/2 = 125 \mu A \quad \Rightarrow R_2 = R_3 = 14,4k\Omega$$