

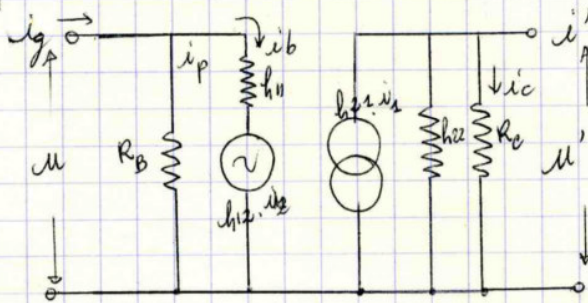
Correction de l'exercice sur la étape amplificatrice  
(BT 65)

I

$$\begin{aligned}
 h_{11e} &= 2,43 \text{ k}\Omega & R_2 &= 32 \text{ k}\Omega \\
 h_{21e} &= 143 & R_E &= 1,55 \text{ k}\Omega \\
 h_{22e} &= 144 \text{ pA/V} & R_C &= 2 \text{ k}\Omega \\
 h_{12e} &= 0
 \end{aligned}$$

II (voir cours)

schéma équivalent



III

G<sub>i</sub> du transistor

$$G_i = \frac{h_{21}}{1 + h_{22} \cdot R_u} = \frac{143}{1 + 144 \times 10^{-3} \cdot 2}$$

$$G_i = \frac{143 \cdot 10^3}{1 + 0,288} = \frac{143}{1,288} \approx 111$$

G<sub>i</sub> de l'étape

$$G'_i = \frac{i_c}{i_g} = \frac{i_c}{i_b} \cdot \frac{i_b}{i_g} = \frac{i_c}{i_b} \cdot \frac{R_B}{R_B + h_{11}}$$

$$R_B = \frac{R_1 \cdot R_2}{R_1 + R_2} = 22,8 \text{ k}\Omega$$

$$G'_i = \frac{G_i \cdot R_B}{R_B + h_{11}} \approx 100$$

$$G_u = - \frac{R_C \cdot i_c}{h_{22} \cdot i_b} \approx -94$$

IV

$I_b$  crête 1  $\mu\text{A}$   
valeur efficace:  $I_b = I_{b \text{ max}} = \frac{1}{\sqrt{2}} \cdot \mu\text{A}$

$$\begin{aligned}
 P_{\text{modulée}} &= R_C \cdot I_c^2 \\
 I_c &= G'_i \cdot i_b \\
 &= 2000 \cdot 111 \cdot \frac{1}{2} \times 10^{-12}
 \end{aligned}$$

$$P_{\text{mod}} = 12,200 \times 10^{-3} \approx 12,2 \mu\text{W}$$