given: $U_B := 12\,\text{V}$, $I_C := 0.0033\,\text{A}$, $\beta_{DC} := 210$ @ 5mA, $U_{BE} := 0.6\,\text{V}$, $f := 14000000\,\text{Hz}$
$U_T := 0.028\,\text{V}$ @ 5mA, $R_L := 1500\,\text{Ohm}$, $f_T := 300000000\,\text{Hz}$

1.) Calculate Bias Voltages:

$U_{RC} := 0.413 \cdot U_B = 4.956$ V

$U_{RE} := 0.1 \cdot U_B = 1.2$ V

$U_{CE} := U_B - U_{RE} - U_{RC} = 5.844$ V

2.) Calculate R_E:

$R_E := \frac{U_{RE}}{I_C} = 363.636$ Ohm = 360Ohm

3.) Calculate I_B & I_q:

$I_B := \frac{I_C}{\beta_{DC}} = 0.0000157$ A = 15.7uA $\qquad I_q := 10 \cdot I_B = 0.000157$ A = 157uA

4.) Calculate Bias Resistors:

$R_1 := \frac{U_B - U_{RE} - U_{BE}}{I_q + I_B} = 59008.264$ Ohm = 62k

$R_2 := \frac{U_{RE} + U_{BE}}{I_q} = 11454.545$Ohm = 12k

5.) Calculate Z_{IN}:

$R_{E1} := 300$ Ohm $\qquad R_{E2} := 100$ Ohm variable --> 56...1056Ohm

$r_E := \frac{U_T}{I_C} = 8.485$ Ohm $\qquad \beta_{AC} := \frac{f_T}{f} = 21.429$ $\qquad R_{EV} := \frac{R_{E1} \cdot R_{E2}}{R_{E1} + R_{E2}}$

$Z_{IN} := \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{\beta_{AC} \cdot (r_E + R_{EV})}} = 1507.768$ Ohm $\qquad Z_{IN}$ = 1061...3300Ohm

Z_{IN} = 1.5k @ R_{E2} = 100Ohm --> V_U = 9 (Simulation) --> perfect conditions

R_{E1} and R_{E2} are calculated in 9.). $\qquad$ **clear** (R_{E1}, R_{E2}, R_{EV})

6.) Calculate Input Transformer:

$Z_P := 50$ Ohm $Z_S := Z_{IN} = 1507.768$ Ohm

$\ddot{u} := \sqrt{\frac{Z_S}{Z_P}} = 5.491$

--> Guideline: 4T:22T @ FT37-43 Toroid Core
--> $L_P := 5.6 \cdot 10^{-6}$ H @ FT37-43 Toroid Core
--> $L_S := 169.4 \cdot 10^{-6}$ H @ FT37-43 Toroid Core

$\ddot{u}_{dB} := 10 \cdot \log(\ddot{u}) = 7.397$ dB --> 7.397dB gain!

$Z_S := Z_P \cdot \left(\frac{22}{4}\right)^2 = 1512.5$ Ohm

Requirement:

$X_{LP} := 2 \cdot \pi \cdot f \cdot L_P = 492.602$ Ohm > $9 \cdot Z_P = 450$ Ohm --> correct!

$X_{LS} := 2 \cdot \pi \cdot f \cdot L_S = 14901.202$ Ohm > $9 \cdot Z_{IN} = 13569.912$ Ohm --> correct!

7.) Calculate Z_{OUT}:

$R_C := \frac{U_{RC}}{I_C} = 1501.818$ Ohm

8.) Calculate Output Transformer:

No Transformer needed --> input impedance of SA612 equals 1.5k

9.) Calculate V_U & R_{EV}:

Split up R_E in two parallel resistors R_{E1} & R_{E2} --> precise V_U

$$R_{EV} = \frac{R_{E1} \cdot R_{E2}}{R_{E1} + R_{E2}}$$

$V_U := 10$:

$$V_U = \frac{R_C}{R_{EV}} \xrightarrow{solve, R_{EV}} 150.18181818181818 \text{ Ohm} = 150\text{Ohm}$$

$V_U := 5$:

$$V_U = \frac{R_C}{R_{EV}} \xrightarrow{solve, R_{EV}} 300.36363636363636 \text{ Ohm} = 300\text{Ohm}$$

Simulation: $R_{E1} = 300$ Ohm --> I_C = 3.3mA, R_{E2} = 56...1056Ohm --> V_U = 13...3 @ R_L

10.) Calculate Lower Cut-Off Frequency:

$C_{IN} := 0.0000001$ F = 100nF $\quad C_{OUT} := C_{IN} \quad C_E := C_{IN} \cdot 10 \quad R_{E1} := 200$

$$r_{BE} := \frac{U_T}{I_B} = 1781.818 \text{ Ohm}$$

$$f_{GLI} := \frac{1}{\left(2 \cdot \pi \cdot \left(Z_P \cdot r_{BE}\right) \cdot C_{IN}\right)} = 17.864 \text{ Hz}$$ ... Input Cut Off Frequency

$$f_{GLO} := \frac{1}{\left(2 \cdot \pi \cdot \left(R_C + R_L\right) \cdot C_{OUT}\right)} = 530.195 \text{ Hz}$$ ... Output Cut Off Frequency

$$f_{GLE} := \frac{1}{\left(2 \cdot \pi \cdot \left(Z_P + r_{BE} + R_{E1} \cdot \left(\beta_{DC} + 1\right)\right) \cdot C_E\right)} = 3.615 \text{ Hz}$$

... Emitter Cut Off Frequency

The lowest cut off frequency determines the lower cut off frequency of the amplifier!