

Electronic project

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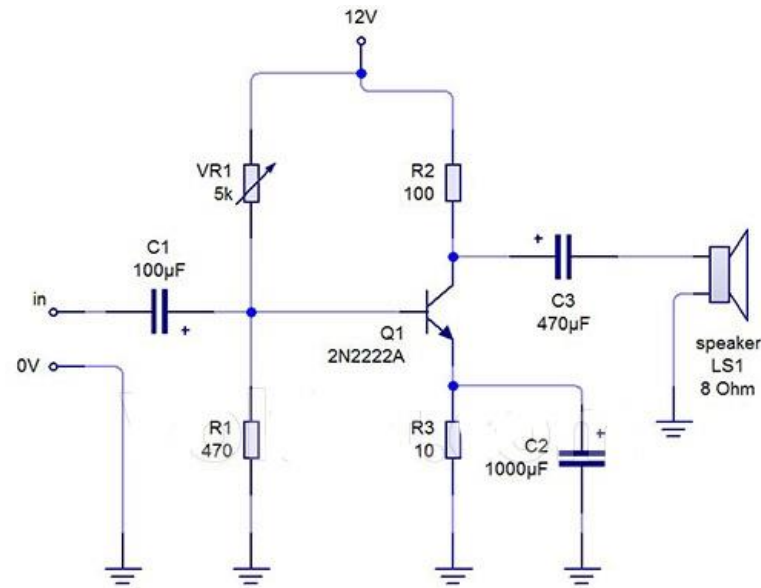
project

Project purpose:

Making a circuit to amplify the sound

components:

- 1- 4 resistors
(10,100,470,5000)
- 2- 3 capacitors
(100,470,1000)
- 3- DC source 12V
- 4- AC source
- 5- Speaker
- 6- Audio input



DC analysis

$$B=100$$

$$V_{th}=12*\frac{470}{470+5000}=1.26\text{ v}$$

$$R_{th}=5000 // 470 = 429\ \Omega$$

From loop

$$1.26 - 470 I_B - .7 - 10 I_B (B+1) = 0$$

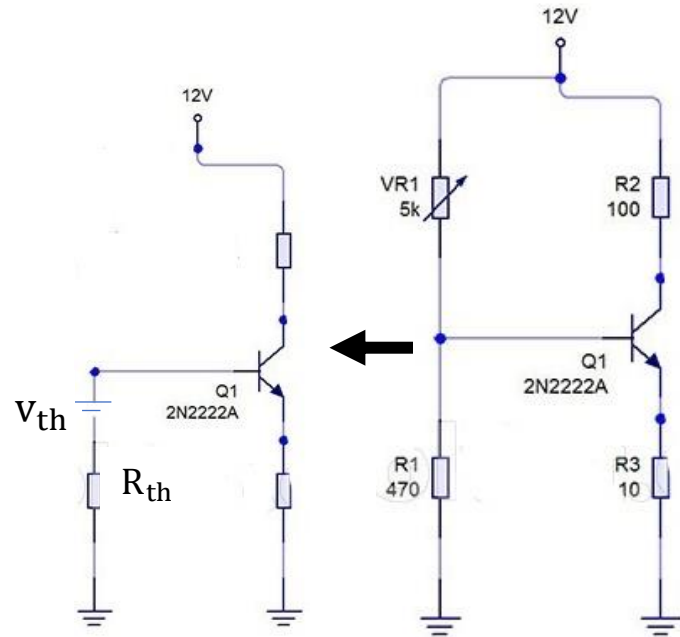
$$I_B = 3.78 * 10^{-4}\ \mu A$$

$$I_C = B I_B = \alpha I_E$$

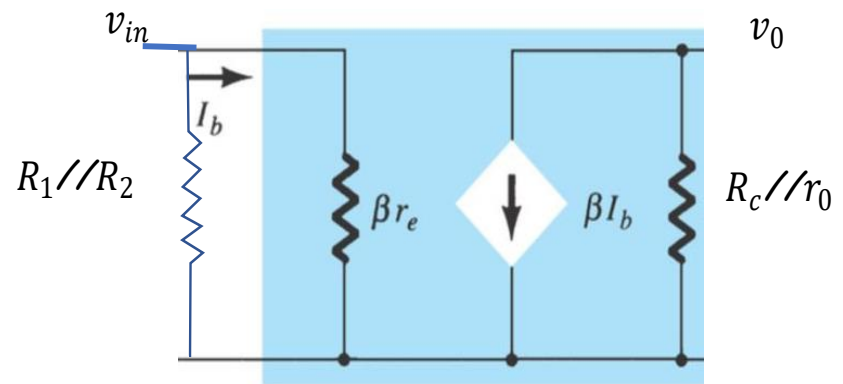
$$I_C = 37.8\text{ mA}$$

$$I_E = 37.9\text{ mA}$$

$$r_e = \frac{26}{I_E} = .68\ \Omega$$



Ac analysis



$$v_0 = (R_c // r_o) \cdot \beta I_b$$

$$v_i = \beta r_e I_b$$

$$A_v = \frac{v_0}{v_i} = \frac{(R_c // r_o) \cdot \beta I_b}{\beta r_e I_b} = \frac{-(R_c // r_o)}{r_e} = \frac{-100}{.578} = 145.76$$