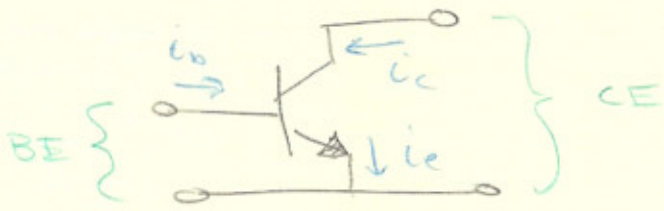
Process of design

1. Enumerate objectives of design.
2. Generate a list of possible ways to achieve objectives.
3. Review and select best alternative
4. Do analysis of remaining options

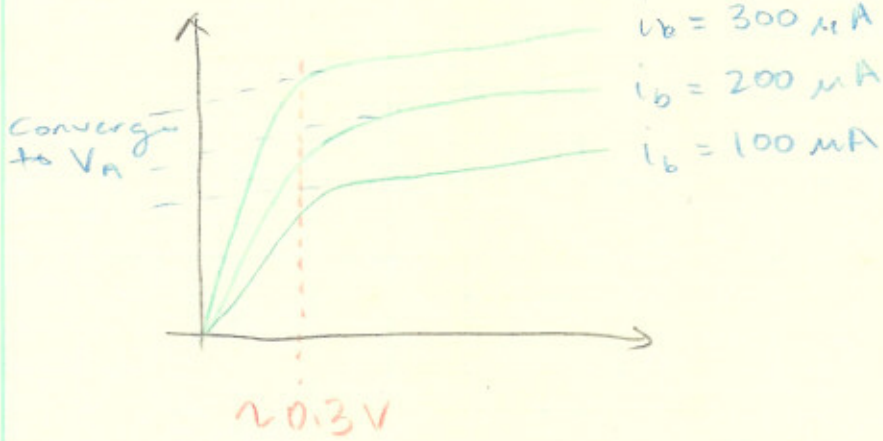
Common Emitter amplifier



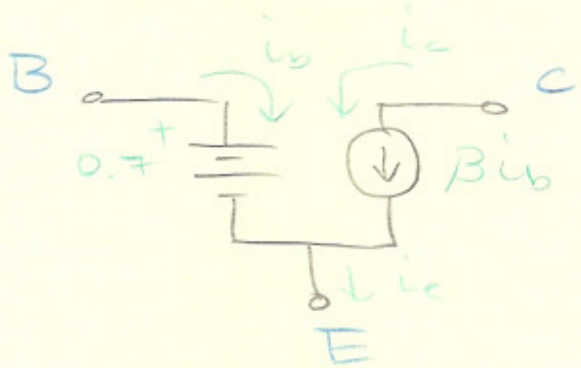
$$i_e = i_c + i_b$$
$$i_c = \beta i_b$$

} during active region.

$$25 < \beta < 250$$



If $V_A \to \infty$ the transistor's collector behaves as a current source



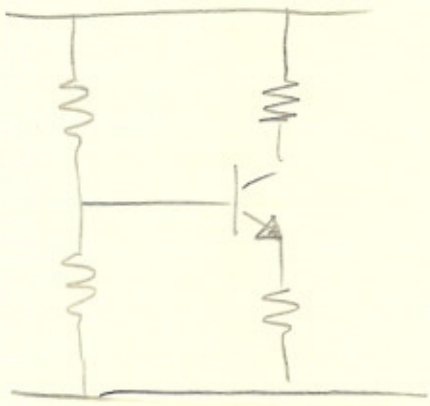
Typically for discrete transmitter

$$V_A \sim 40 \to 100$$

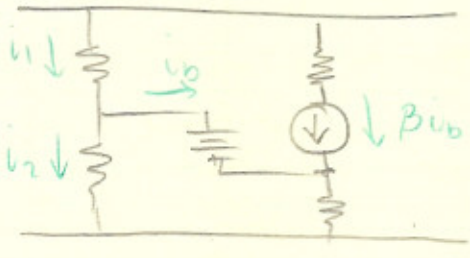
For finding bias point of a transistor in hand analysis we ~~often~~ assume $V_A \to \infty$

For some small signal analysis, V_a is considered... no.... biasing.

* Biasing



Assume Q is in Active region



Assume $I_B = 0$ and calculate I_1 compare I_1 with I_{cmax}; if

$$I_1 >> \frac{I_{cmax}}{\beta}$$

Then we can neglect I_B in I_1 calculation.

Normally $I_1 \doteq I_2 >> I_B$; then we can say

$$V_B \sim V_{cc} \frac{R_2}{R_1 + R_2}$$

$$I_c = \frac{\beta}{\beta + 1} \cdot \frac{V_B - 0.7}{R_E}$$