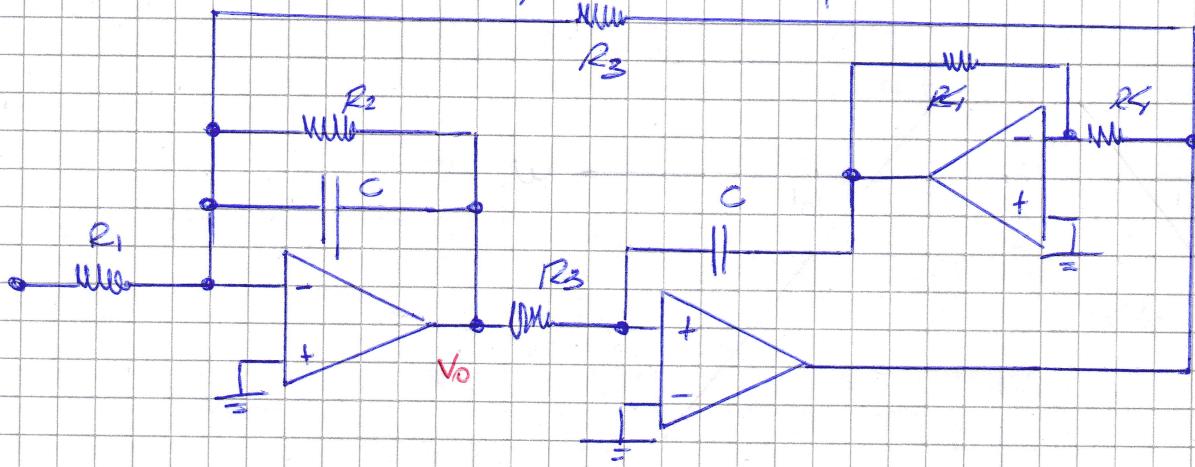


## PUNTO 4

Ahora, debemos utilizar los topologías Astérvs-Mosberg para sintetizar estos frontes.

Si tomo la primera salida del operacional, es un oscilador:



Sabemos que:

$$T(s) = \frac{-\frac{1}{R_2 C} \cdot s}{s^2 + \frac{1}{R_2 C} s + \left(\frac{1}{R_3 C}\right)^2} \quad (TS_2)$$

En resumen, voy a tener que colocar tres etapas Armstrong-Mosberg:

$$|T_2(s)| = \frac{(3,1623) \cdot (0,0913) \cdot s}{s^2 + 0,45s + 1} = \frac{\frac{1}{R'_1 C'} s}{s^2 + \frac{1}{R'_2 C'} s + \left(\frac{1}{C' R'_3}\right)^2}$$

$$\frac{1}{R'_1 C'} = 0,45 \Rightarrow \boxed{R'_1 = 2,22}$$

$$\frac{1}{C' R'_3} = 1 \Rightarrow (R'_2 = R'_3 = 1) \Rightarrow \boxed{C' = 1}$$

$$\frac{1}{R'_2 C'} = 0,45 \Rightarrow \boxed{R'_2 = 2,22}$$

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$$|T_2(s)| = \frac{0,86 s (0,3,10)}{s^2 + 0,2083 s + 1,477} = \frac{\frac{1}{R_1^{II} \cdot C^{II}} \cdot s}{s^2 + \frac{1}{R_2^{II} \cdot C^{II}} s + \left(\frac{1}{C^{II} \cdot R_3^{II}}\right)^2}$$

Reordenando:  $R_2 = R_3 = 1$ .

$$\frac{1}{R_1^{II} \cdot C^{II}} = 2,717 \Rightarrow \left( \frac{1}{R_1^{II} \cdot C^{II}} = 0,45 \right)$$

$$\frac{1}{R_2^{II} \cdot C^{II}} = 0,2083 \Rightarrow \left( \frac{1}{R_2^{II} \cdot C^{II}} = 4,52 \right)$$

$$\left( \frac{1}{C^{II} \cdot R_3^{II}} \right)^2 = 1,477 \Rightarrow C^{II} = \sqrt{1,477} \\ \left( C^{II} = 0,82 \right)$$

$$|T_3(s)| = \frac{0,23 \cdot s}{s^2 + 0,1816 s + 0,477} = \frac{\frac{1}{R_1^{III} \cdot C^{III}}}{s^2 + \frac{1}{R_2^{III} \cdot C^{III}} s + \left(\frac{1}{C^{III} \cdot R_3^{III}}\right)^2}$$

$$\frac{1}{R_1^{III} \cdot C^{III}} = 0,23 \quad (2) \quad (R_2 = R_3 = 1)$$

$$\frac{1}{R_2^{III} \cdot C^{III}} = 0,1816 \Rightarrow \left( \frac{1}{R_2^{III} \cdot C^{III}} = 4,51 \right) \Rightarrow \left( R_1^{III} = 3,57 \right)$$

$$\frac{1}{C^{III} \cdot R_3^{III}} = \sqrt{0,477} \Rightarrow \left( C^{III} = 1,22 \right)$$

$$R_4^I = R_4^{II} = R_4^{III} = 1 //$$

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PUNTO (3)