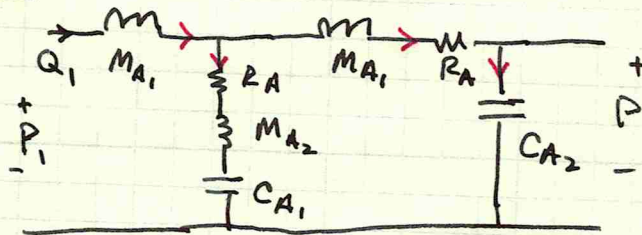


daerah

Acoustic

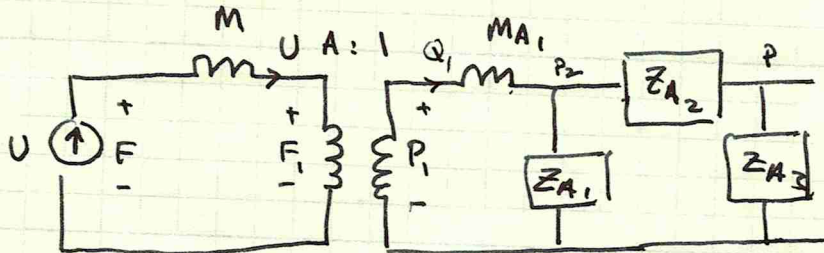


where $M_{A1} = \frac{\rho_0 L_1}{A}$

$M_{A2} = \frac{\rho_0 L_2}{A}$

$C_{A1} = \frac{V}{\rho_0 c^2}$

$C_{A2} = \frac{V}{\rho_0 c^2}$



$Z_{A1} = R_A + M_{A2} + C_{A1}$

$Z_{A2} = M_{A1} + R_A$

$Z_{A3} = C_{A2}$

(b)
$$\left. \begin{aligned} F &= U M_S + F_1 \\ Q_1 &= U A \\ \frac{F_1}{A} &= P_1 \end{aligned} \right\} \frac{F}{A} = Q_1 \frac{M_S}{A^2} + P_1 \quad (1)$$

$$Q_1 = \frac{P_1 - P_2}{M_{A1} S} = \frac{P_2}{Z_{A1}} + \frac{P_2 - P}{Z_{A2}} \quad (2)$$

Q_1 is known
 F, P_1, P_2, P

$$\frac{P_2 - P}{Z_{A2}} = \frac{P}{Z_{A3}} \quad (3)$$

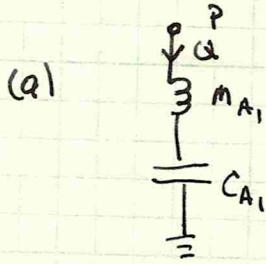
$$Q_1 = \frac{P_1 - P_2}{M_{A1} S} \quad (4)$$

(c) (2) $\rightarrow Q_1 = \frac{P_2}{Z_{A1}} + \frac{P_2 - P}{Z_{A2}}$
 (3) $\frac{P_2 - P}{Z_{A2}} = \frac{P}{Z_{A3}}$

$$\left. \begin{aligned} & \\ & \end{aligned} \right\} P = Q_1 \frac{Z_{A1} Z_{A3}}{Z_{A1} + Z_{A2} + Z_{A3}}$$

where $Q_1 = U A$

(2)



$$P = M_{A_1} s Q + \frac{1}{C_{A_1}} Q$$

(b)

$$M_{A_1} = \frac{\rho_0 l}{A}$$

$$C = 345 \text{ m/sec}$$

$$\rho_0 = 1.14 \text{ kg/m}^3$$

$$C_{A_1} = \frac{A}{\rho_0 c^2}$$

$$\frac{P}{Q} = \frac{M_{A_1} C_{A_1} s^2 + 1}{C_{A_1} s}$$

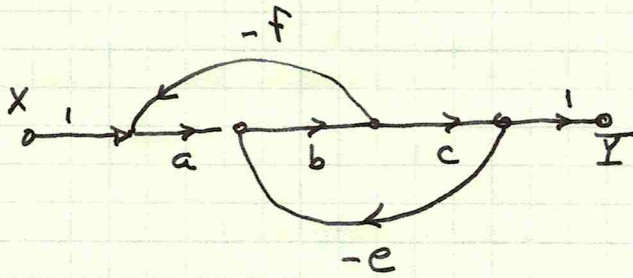
$$s = j \frac{1}{\sqrt{M_{A_1} C_{A_1}}}$$

$$f_{res} = \frac{1}{2\pi} \frac{1}{\sqrt{M_{A_1} C_{A_1}}} = \frac{1}{2\pi} \frac{1}{\sqrt{\frac{\rho_0 l}{A} \cdot \frac{A}{\rho_0 c^2}}}$$

$$C = 345 \text{ m/sec} = 345 \times 100 \text{ cm/sec} \quad A = (0.9 \text{ cm})^2 \pi$$

$$f_{res} = \frac{1}{2\pi} \frac{1}{\sqrt{\frac{(345)(7)}{(345 \times 10^2)^2 \times 0.9^2 \pi}}} = \frac{0.9 \times 345 \times 10^2}{\sqrt{345 \times 7}} \frac{\sqrt{\pi}}{2\pi} = 178$$

3



Forward path

 $P_1 = abc$

loop

 $L_1 = abf(-1)$

 $L_2 = bce(-1)$

$$\Delta = 1 - (L_1 + L_2)$$

$$\Delta_1 = 1$$

$$\frac{Y}{X} = \frac{P_1 \Delta_1}{\Delta} = \frac{abc}{1 + (abf + bce)}$$