

# INTENSIDAD

# SONORA

HOJA Nº

FECHA

25) PÁG. 62

$$I = 2 \cdot 10^{-4} \text{ W/m}^2 \quad \Delta x = 40 \text{ m} \quad P = ? \quad Vol = 4\pi r^2$$

$$I = \frac{Pot}{Sup} \Rightarrow Pot = I \cdot Sup \Rightarrow Pot = 2 \cdot 10^{-4} \frac{\text{W}}{\text{m}^2} \cdot 4\pi (40)^2 \text{ m}^2$$

$$Pot = 4,02 \text{ W}$$

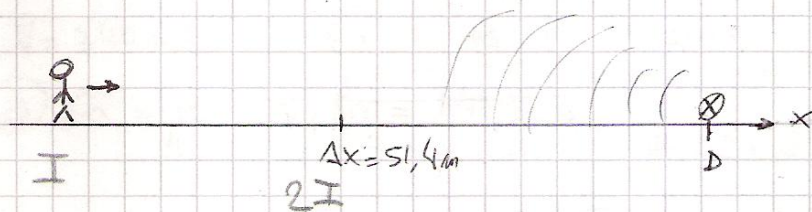
26) PÁG. 62  $\beta = 40 \text{ db}$   $\Delta x = 2 \text{ m}$

$$\beta = \log \left( \frac{I}{I_0} \right) \quad (\log_a c = b \Rightarrow a^b = c)$$

$$10^4 = I_T \Rightarrow 1 \cdot 10^4 = I_T \quad I = I_T \cdot 10^{-12} \Rightarrow I = 1 \cdot 10^{-8} \frac{\text{W}}{\text{m}^2}$$

$$Pot = I \cdot Sup \Rightarrow P = 1 \cdot 10^{-8} \frac{\text{W}}{\text{m}^2} \cdot 4\pi (4 \text{ m})^2 \Rightarrow P = 5,02 \cdot 10^{-7} \text{ W}$$

28) PÁG. 62  $\Delta x = 51,4 \text{ m} \rightarrow I = I_2 \quad d = ?$



$$Pot_1 = I \cdot Sup$$

$$Pot_2 = 2I \cdot Sup$$

$$Pot_1 = Pot_2$$

$$I \cdot Sup = 2I \cdot Sup$$

$$4\pi d^2 = 2(4\pi (d-x)^2) \Rightarrow 4\pi d^2 = 8\pi [d^2 - 2dx + x^2]$$

$$d = \sqrt{\frac{2d^2 - 4dx + 2x^2}{4}}$$

$$d_1 = \sqrt{1027,7} \Rightarrow d_1 = 32,05$$

$$d_2 = \sqrt{925}$$



129 | PÁG. 62

$$\beta_1 = 67 \text{ db} (6,7b) \quad \beta_2 = 76 \text{ db} (7,6b)$$

$$P_{OT1} = I_1 \cdot S_{OP}$$

$$P_{OT2} = I_2 \cdot S_{OP}$$

$$\beta = \log \frac{I}{I_0} \Rightarrow$$

$$I_1 = 10^{6,7} \cdot 10^{-12} \Rightarrow I_1 = 5,01 \cdot 10^{-6}$$

$$I_2 = 10^{7,6} \cdot 10^{-12} \Rightarrow I_2 = 3,98 \cdot 10^{-5}$$

a)

$$\frac{P_{OT2}}{P_{OT1}} = \frac{I_2 \cancel{S_{OP}}}{I_1 \cancel{S_{OP}}}$$

$$\Rightarrow \frac{I_2}{I_1} = 10^{0,9} \approx 7,94 \text{ db}$$

b)  $I = \frac{1}{2} \frac{P^2}{P_V}$

$$\sqrt{2IP_V} = P_1 \quad \wedge \quad \sqrt{2IP_V} = P_2$$

$$P_2 = \sqrt{2IP_V}$$

$$P_1 = \sqrt{2IP_V}$$

$$\frac{P_2}{P_1} = \frac{6,30 \cdot 10^{-3}}{2,23 \cdot 10^{-3}} \Rightarrow \frac{P_2}{P_1} = 2,82$$

130 | PÁG. 62

$$\beta = 80 \text{ db} (8b)$$

$$\beta = \log \left( \frac{I}{I_0} \right) \Rightarrow 10^8 = I \cdot I_0 \Rightarrow I = 10^{-4} \frac{W}{m^2}$$

131 | PÁG. 62

$$\beta_1 = ? \quad \beta_2 = \beta_1 + 50 \text{ db}$$

$$\beta_1 = 10 \log \left( \frac{I_1}{I_0} \right) ; \quad \beta_2 = 50 + 10 \log \left( \frac{I_2}{I_0} \right)$$

$$\beta_1 = \beta_2$$

$$10 \log \left( \frac{I_1}{I_0} \right) = 50 + 10 \log \left( \frac{I_2}{I_0} \right) \Rightarrow 10 \left[ \log \left( \frac{I_1}{I_0} \right) - \log \left( \frac{I_2}{I_0} \right) \right] = 50$$

$$\Rightarrow \log \left( \frac{I_1}{I_2} \right) = 5 \Rightarrow \frac{I_1}{I_2} = 10^5$$

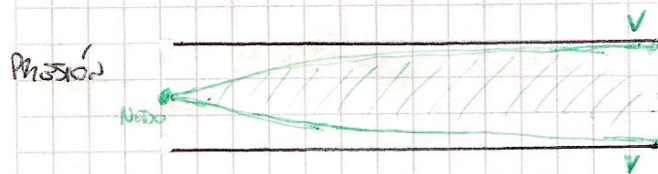
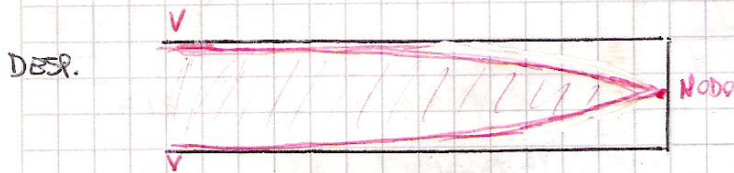


[34] PÁG. 63

$$L = 30 \text{ cm} (0,3 \text{ m}) \quad V = 340 \text{ m/s} \quad f_0 = ?$$

CERRADO EN UN  
EXTREMO

$$f_n = \frac{V}{4L} \Rightarrow f_n = \frac{340 \text{ m/s}}{4 \cdot 0,3 \text{ m}} \Rightarrow f_n = 283,3 \text{ Hz}$$



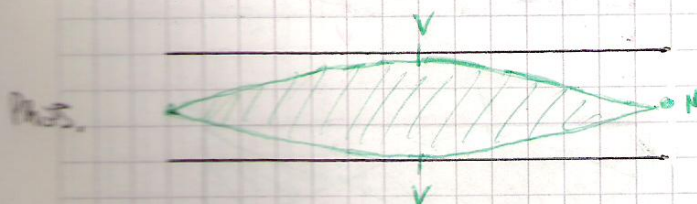
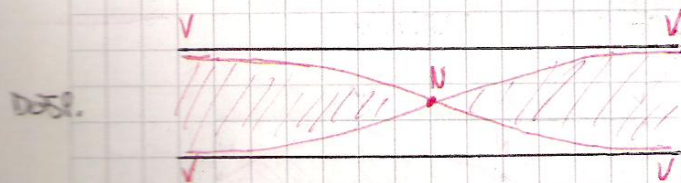
[35] PÁG. 63

$L = 0,60 \text{ m}$  -  $f_n$  si es abierto en un extremo

$V = 340 \text{ m/s}$  -  $f_n$  si es " " " " " " " " " " " "

a)  $f_n = \frac{V}{4L} \Rightarrow f_n = 141,6 \text{ Hz}$

b)  $f_n = \frac{V}{2L} \Rightarrow f_n = 283,3 \text{ Hz}$



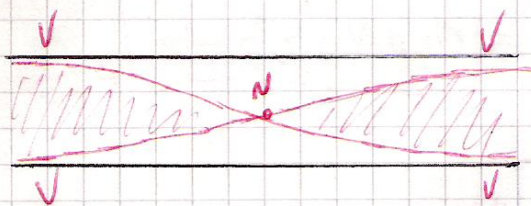


[36] PÁG. 63

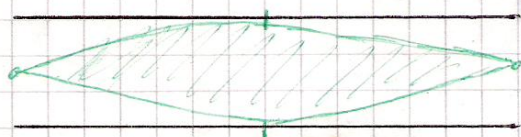
ABIERTO EN AMBOS EXTREMOS

$L = 0,4 \text{ m}$      $V = 340 \text{ m/s}$      $f_1 = ?$

$$f_n = \frac{v}{2L} \Rightarrow f_1 = \frac{340 \text{ m/s}}{2 \cdot 0,4 \text{ m}} = \boxed{f_1 = 425 \text{ Hz}}$$



Desp.



Phasor

[37] PÁG. 63

CERRADO EN UN EXTREMO

$f_1 = 110 \text{ Hz}$      $f_2 = ?$

$$f_1 = \frac{v}{4L} \Rightarrow L = \frac{v}{4f} \Rightarrow L = \frac{340 \text{ m/s}}{4 \cdot 110} \Rightarrow L = 0,77 \text{ m}$$

$$f_n = \frac{(2n-1) \cdot v}{4L} \Rightarrow f_n = \frac{(2 \cdot 2 - 1) \cdot 340 \text{ m/s}}{4 \cdot 0,77 \text{ m}} \Rightarrow f_2 = \frac{3 \cdot 340}{3,08} \Rightarrow \boxed{f_2 = 331,16 \text{ Hz}}$$

