

6. (a) The time it takes for sound to travel in air is  $t_a = L/v$ , while it takes  $t_m = L/V$  for the sound to travel in the metal. Thus

$$t = t_a - t_m = \frac{L}{v} - \frac{L}{V} = \frac{L(V - v)}{Vv} .$$

- (b) Using the values indicated (see Table 18-1), we obtain

$$L = \frac{t}{1/v - 1/V} = \frac{1.00 \text{ s}}{1/(343 \text{ m/s}) - 1/(5941 \text{ m/s})} = 364 \text{ m} .$$