

62. Let the range of frequency of the microwave be Δf . Then the number of channels that could be accommodated is

$$N = \frac{\Delta f}{10 \text{ MHz}} = \frac{(2.998 \times 10^8 \text{ m/s})[(450 \text{ nm})^{-1} - (650 \text{ nm})^{-1}]}{10 \text{ MHz}} = 2.1 \times 10^7 .$$

The higher frequencies of visible light would allow many more channels to be carried compared with using the microwave.