

Necessary Bandwidth

Calculations are based on worst case alternating 10101010 data.

$$BaudRate(BR) = 1200$$

$$Tone1 = 1300Hz$$

$$Tone2 = 2100Hz$$

$$\begin{aligned} DeviationAudio(D_A) &= (Tone2 - Tone1) \div 2 \\ &= (2100 - 1300) \div 2 \\ &= 400Hz \end{aligned}$$

$$\begin{aligned} FrequencyCenterAudio(F_{CA}) &= ((Tone2 - Tone1) \div 2) + Tone1 \\ &= ((2100 - 1300) \div 2) + 1300 \\ &= 1700Hz \end{aligned}$$

$$\begin{aligned} BandWidthNecessaryAudio(BW_{NA}) &= F_{CA} \pm ((BR + 1.2 * D_A * 2) \div 2) \\ &= 1700 \pm ((1200 + 1.2 * 400 * 2) \div 2) \end{aligned}$$

$$LowerLimit \quad 620Hz$$

$$UpperLimit \quad ,2780Hz \quad HighestModulatingTone$$

$$DeviationRadioFrequency(D_{RF}) = 2KHz$$

$$ModulationHighestTone(M_{HT}) = 2780Hz$$

$$\begin{aligned} BandWidthNecessaryRadioFrequency(BW_{NRF}) &= 2 * M_{HT} + 1.0 * D_{RF} * 2 \\ &= 2 * 2780Hz + 1.0 * 2KHz * 2 \\ &= 9560Hz \end{aligned}$$