Thomas Smallarz ECE444 Homework 2

2.5-1) Consider a microphone intended for use in a music recording studio. Determine a suitable frequency response for the microphone, and provide suitable values to specify the response.

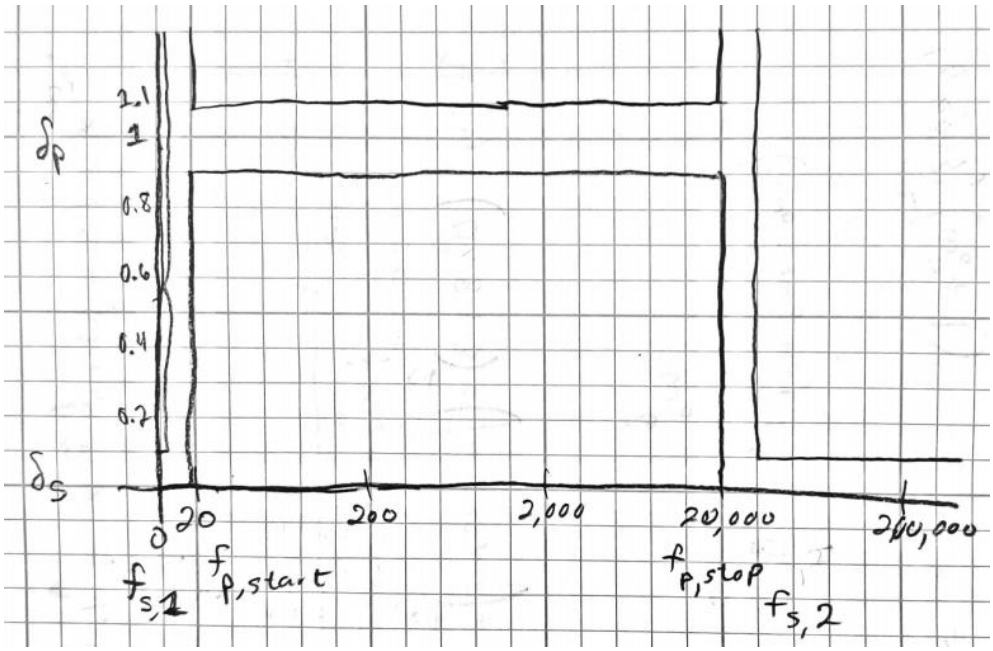
First, some info

- Human hearing is in the range of 20Hz → 20kHz
- Humans "readily perceive amplitude distortion, but are relatively insensitive to phase distortion"

What this means

- We should definetly pass 20Hz → 20kHz.
- The pass-band ripple should be very low

An ideal frequency response for a microphone would be a "pulse" with a pass-band from 20Hz to 20kHz with a gain of 1. If we are talking a non-ideal world, then I would think something that has little pass-band ripple and covers the whole frequency range would be good.



$$\delta_p = 0.9 \rightarrow 1.0\,, \quad \delta_s = 0 \rightarrow 0.1$$

$$f_{s,1} = 10Hz \quad f_{s,2} = 22{,}000Hz$$

$$f_{p,start} = 20Hz \quad f_{p,stop} = 20{,}000Hz$$