OFDM

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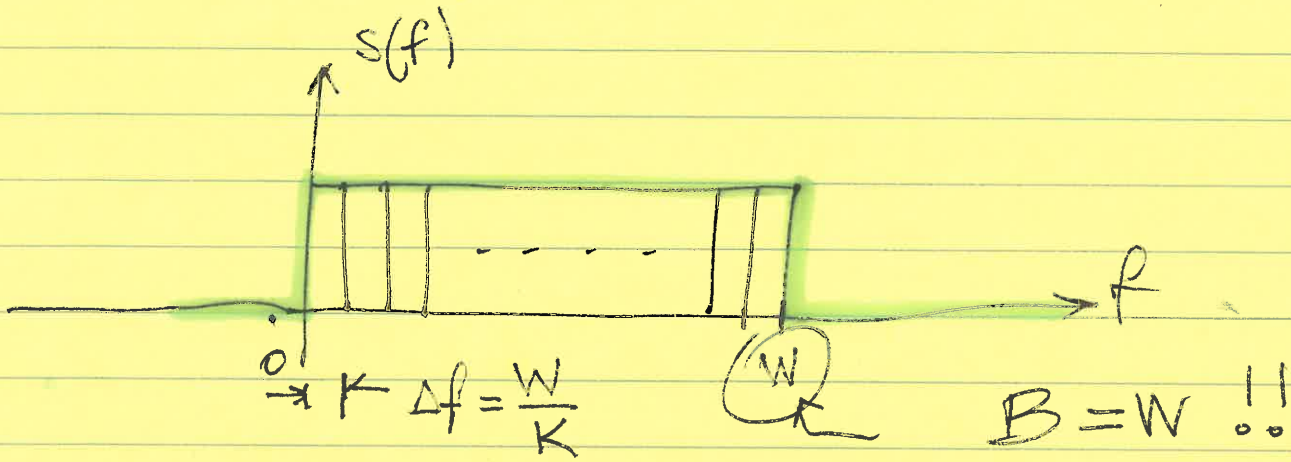
Divide bandwidth ($B = W$) into K subchannels



Note: Negative frequency range $|S(f)| = 0$ (complex valued)

→ K complex-valued **exponential subcarriers**. → $\underset{k=0,1,..,K-1}{e^{j\frac{2\pi}{T}\cdot k\cdot t}}$

→ Symbol duration from bandwidth with **sinc-pulses**:

$$\Delta f = \frac{1}{T} = \frac{W}{K} \quad (\text{RC spectrum } \alpha = 0)$$

$$\therefore \boxed{T = \frac{K}{W}}$$

SYMBOL DURATION IS PROPORTIONAL TO K

This can be extended to "raised-cosine pulses" (dual of RC spectrum) in the time domain.

→ Sample at intervals of length $\boxed{T_s = \frac{T}{K} = \frac{1}{W}}$