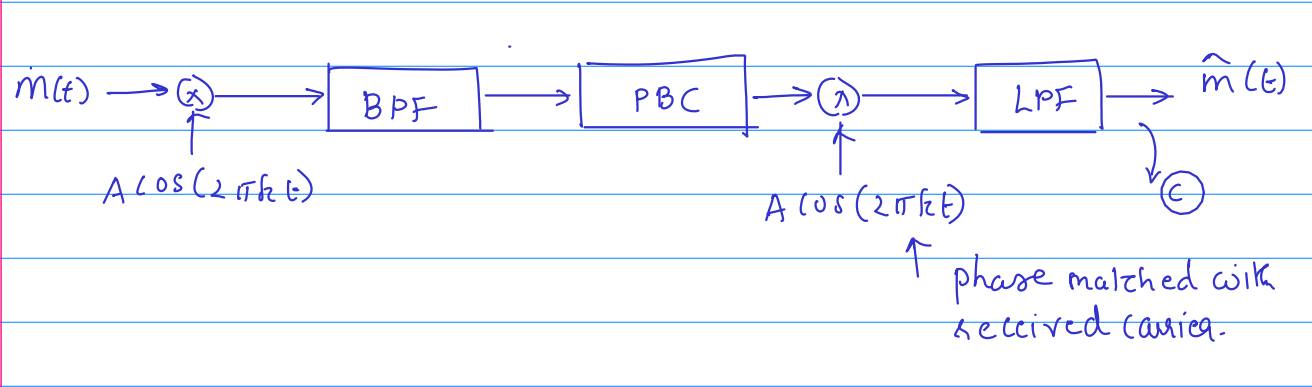
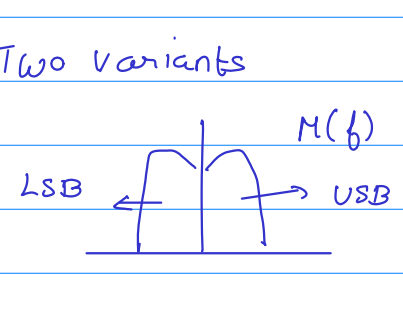
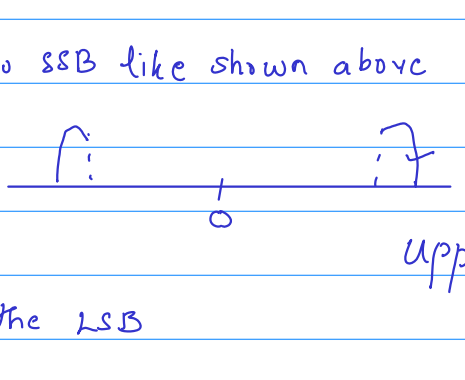
SSB modulation / demodulation



Two variants

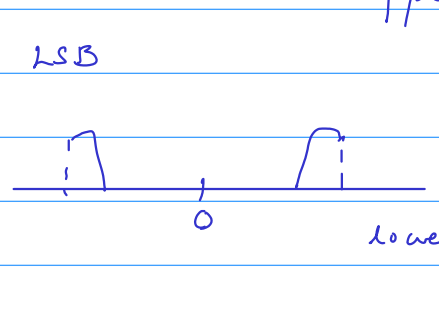


If we do SSB like shown above



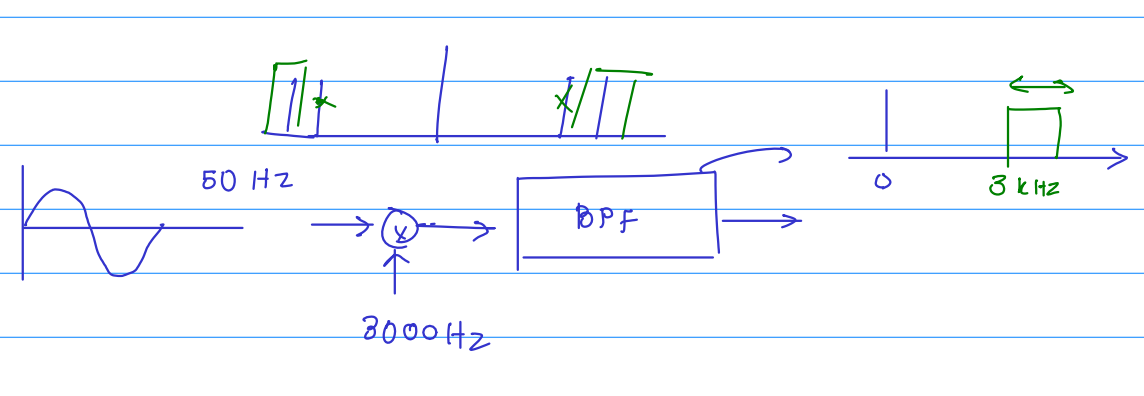
Upper side band

Suppose we change the BPF to fix the LSB

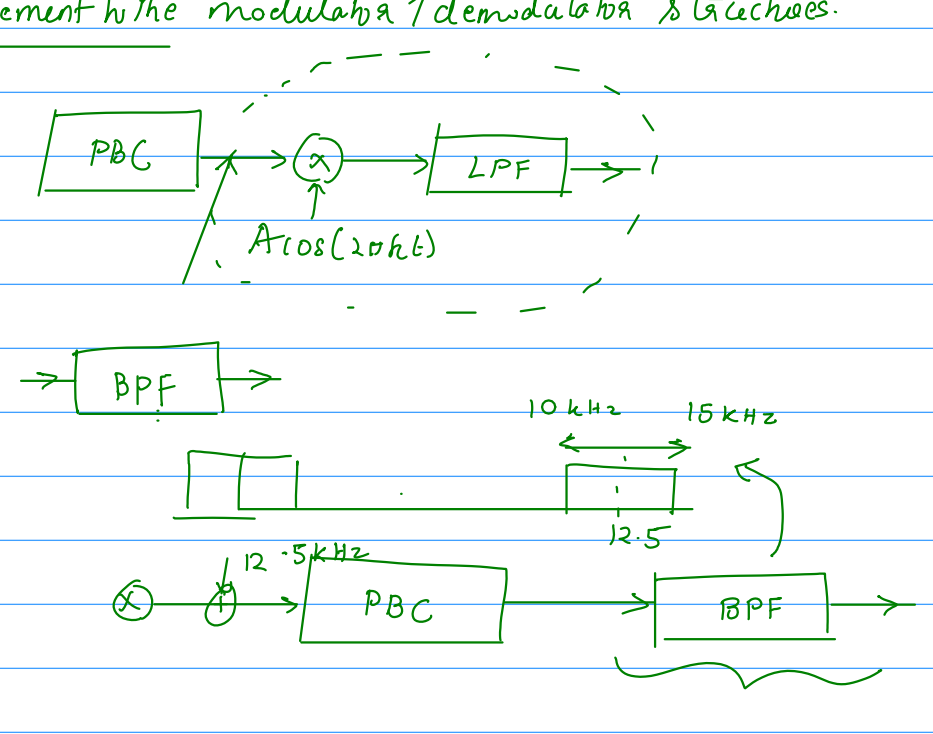


lower side band

example :

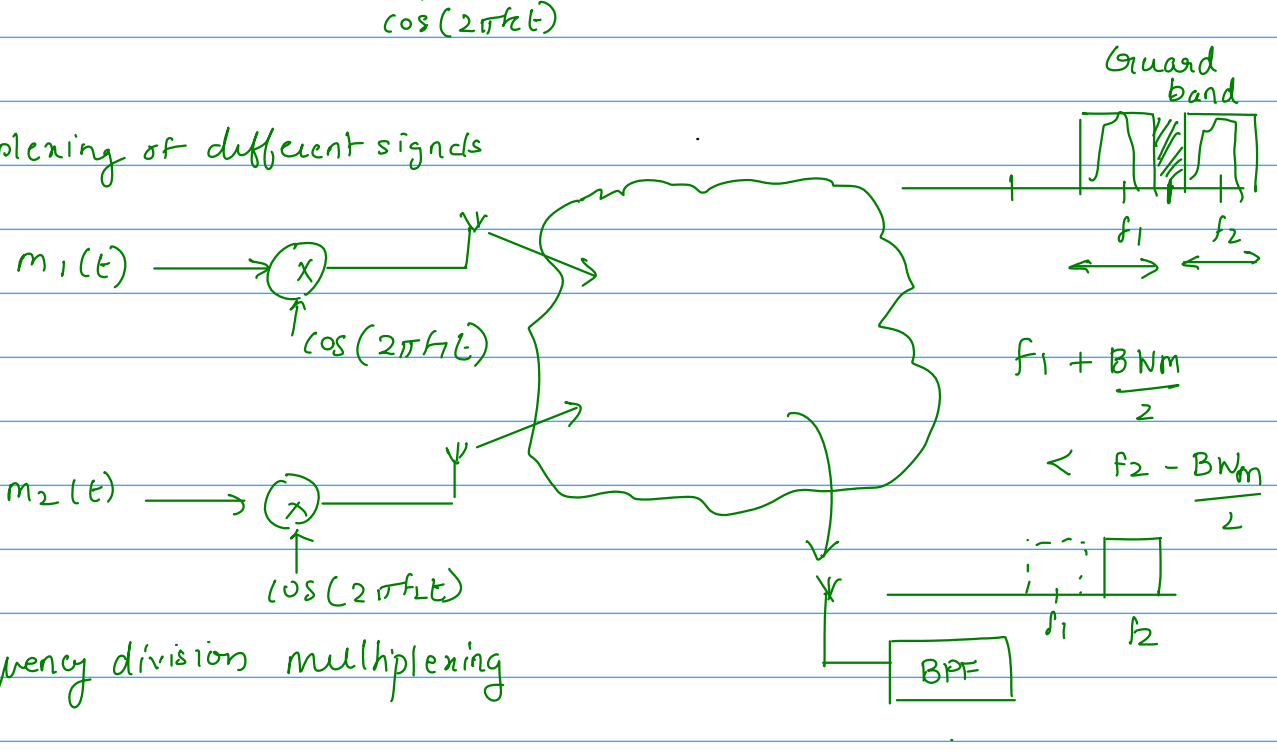


A refinement to the modulator / demodulator structures.



DSBSC

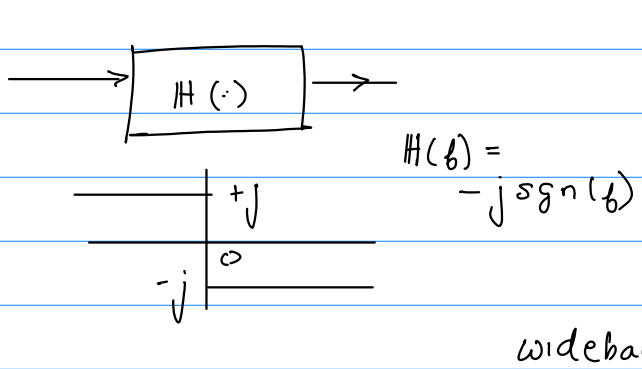
Multiplexing of different signals



frequency division multiplexing

How to look at SSB signals in time domain?

Hilbert transform



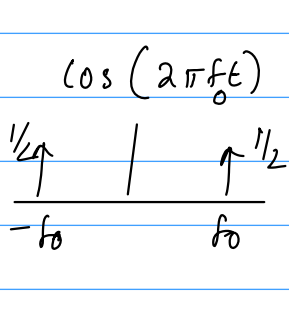
$H(f) = -j\,\mathrm{sgn}(f)$

H/W : UM — wideband 90° phase shifter.

$\left(* \frac{1}{\pi t}\right)$ in time domain

how does this equivalence come about?

$\cos(2\pi f_0 t) \rightarrow H(\cdot) \rightarrow$



$= \left(\frac{e^{j2\pi f_0 t} + e^{-j2\pi f_0 t}}{2}\right) \rightarrow (\cdot) \rightarrow \frac{-j e^{j2\pi f_0 t} + j e^{-j2\pi f_0 t}}{2}$

$\sin(2\pi f_0 t) \Leftarrow \frac{e^{2j\pi f_0 t} - e^{-j2\pi f_0 t}}{2j} \Leftarrow$

→ Quiz 1

Lectures 1 to 15.

UM – chapter on analog modulation.