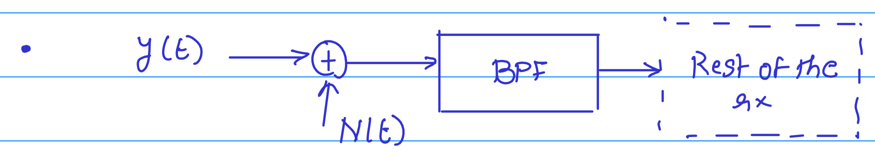
Review.

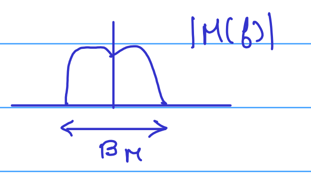
- 

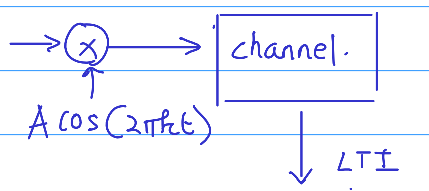
- $N(t)$ is AWGN with PSD $N_0/2$
- N_0 described by noise temp or noise figure.

SNR - performance evaluation for analog modulation schemes.

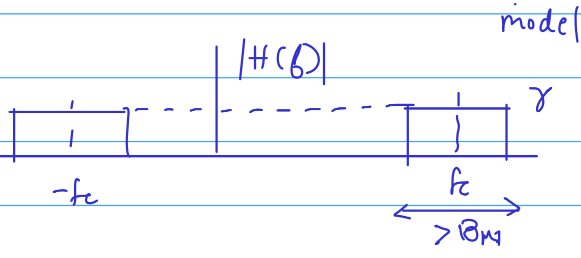
Let us consider DSBSC

Baseband signal (m(t))



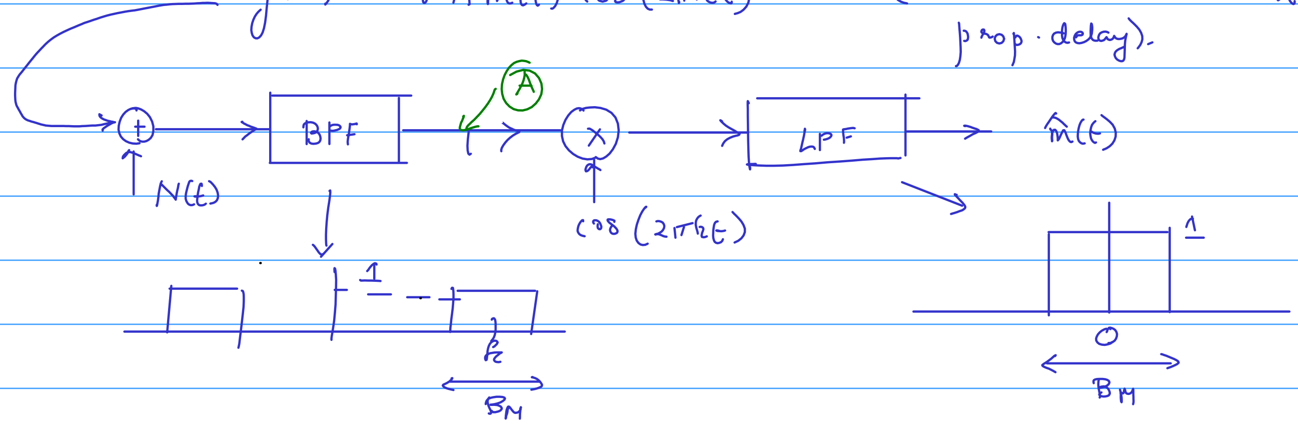


γ is dependent on distance,
freq of operation,
antennae gains.



At the output of the channel?

$y(t) = \gamma A\, m(t) \cdot \cos(2\pi f_c t)$ (remember discussion abt prop. delay).

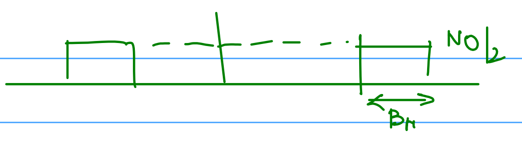


Ⓐ how does the comb. of signal and noise look like here?

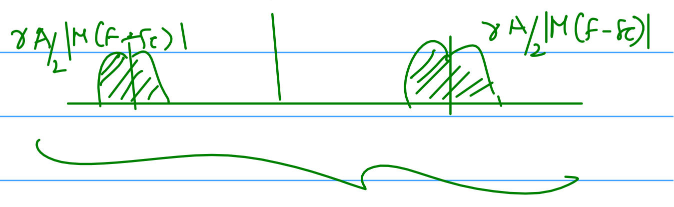
deterministic (desired) component at Ⓐ is $\gamma A m(t) \cos(2\pi f_c t)$

noise component at Ⓐ has a mean of 0.

autocorrelation / PSD

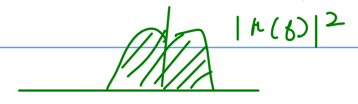


magnitude spectrum



$SNR_A = \frac{\text{Signal power}}{\text{noise power}}$

suppose Em is the energy in m(t)



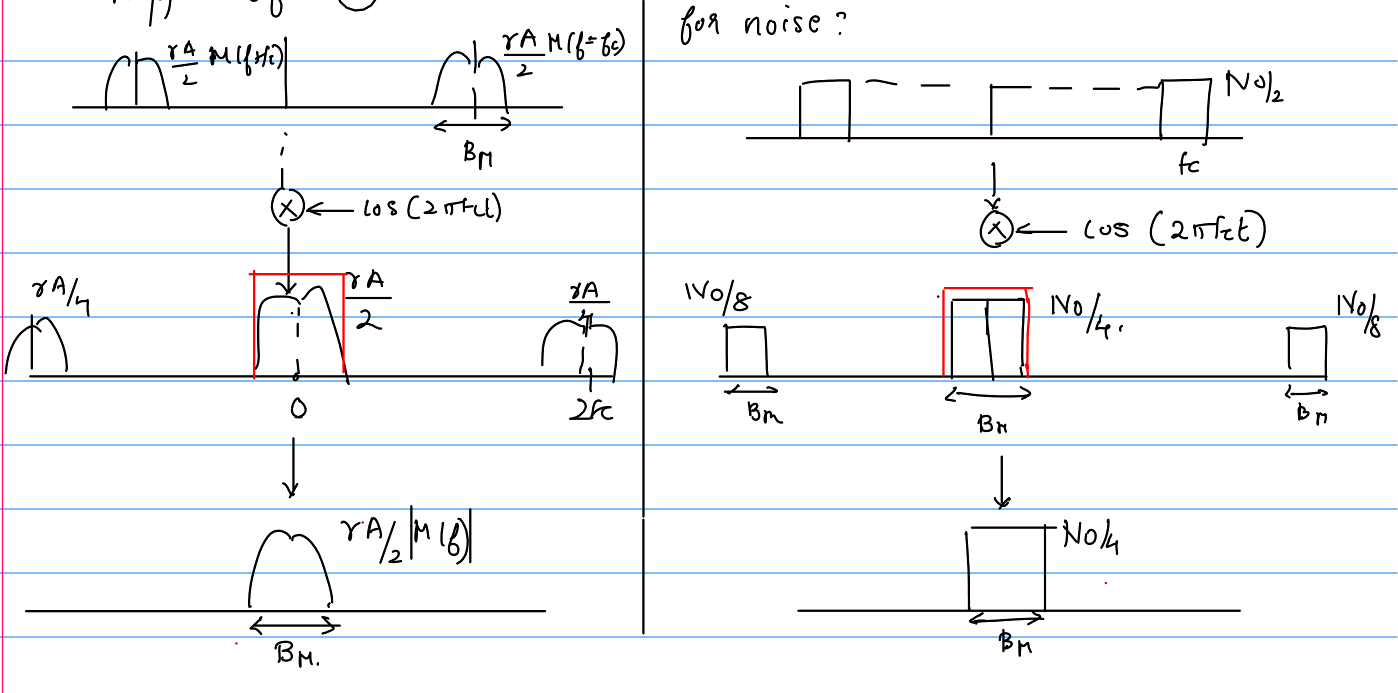
signal energy is $\frac{\gamma^2 A^2}{2} E_m$

signal power as $\frac{\gamma^2 A^2}{2} \frac{E_m}{T_m} = \frac{\gamma^2 A^2 P_m}{2}$

noise power? from PSD $= N_0 \cdot B_M$

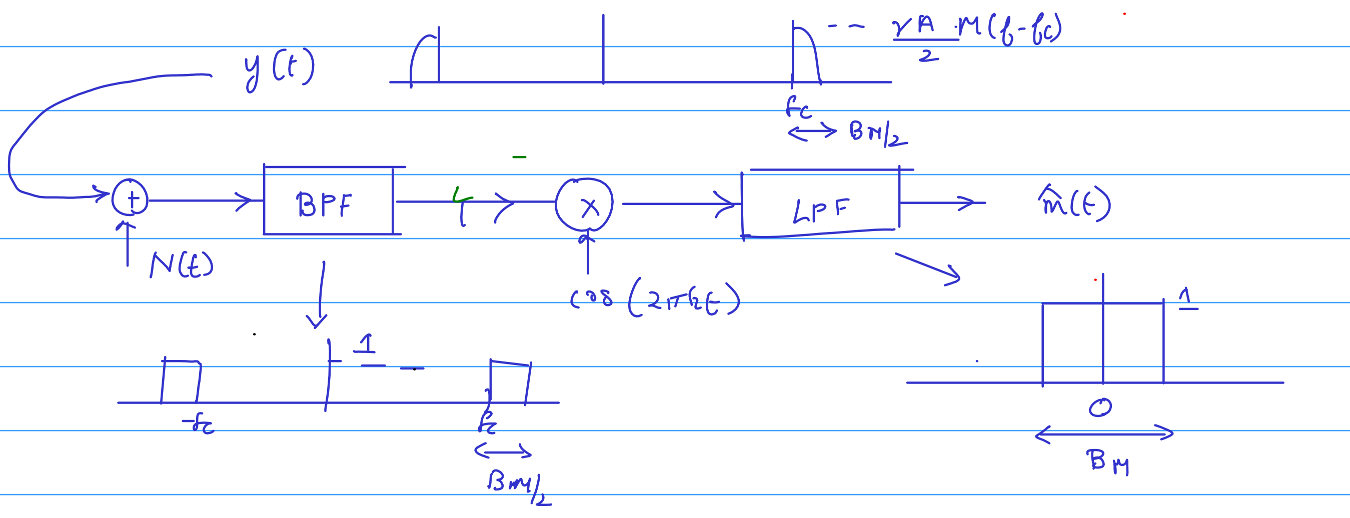
$SNR_A = \left(\frac{\gamma^2 A^2 P_m}{2 N_0 B_m}\right)$

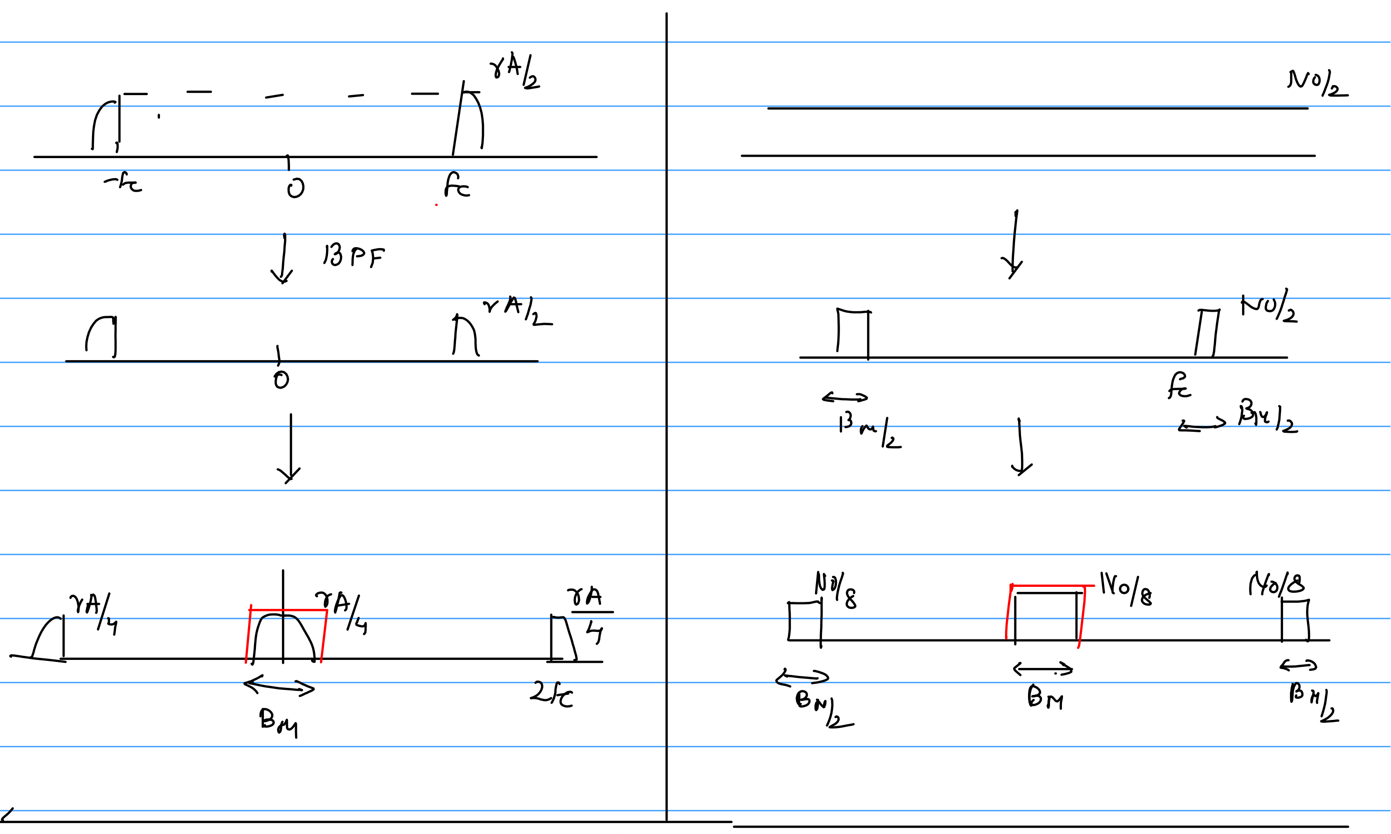
What happens after Ⓐ



$$SNR_{DSB} = \frac{\gamma^2 A^2 P_m}{N_0 \cdot B_M}$$

What is SNR for SSB?





$$SNR_{SSB} = \frac{\gamma^2 A^2/16 \cdot P_m}{N_0/8\, B_M} = \left(\frac{\gamma^2 A^2 P_m}{2 N_0 B_m.}\right)$$

In the textbook, $\underbrace{m(t) \cos(2\pi f_c t)} - \underline{\hat{m}(t) \sin(2\pi f_c t)}$

$\frac{1}{2}\left(M(f-f_c) + M(f+f_c)\right)$ $\quad$ $\frac{1}{2}\left(\hat{M}(f-f_c) + \hat{M}(f+f_c)\right)$