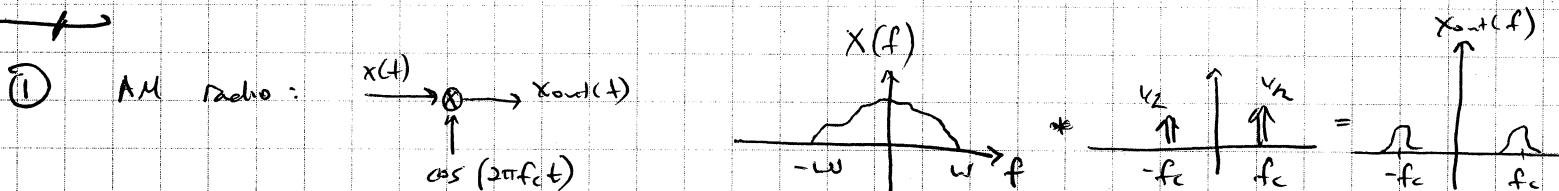


Today: SSB Modulation

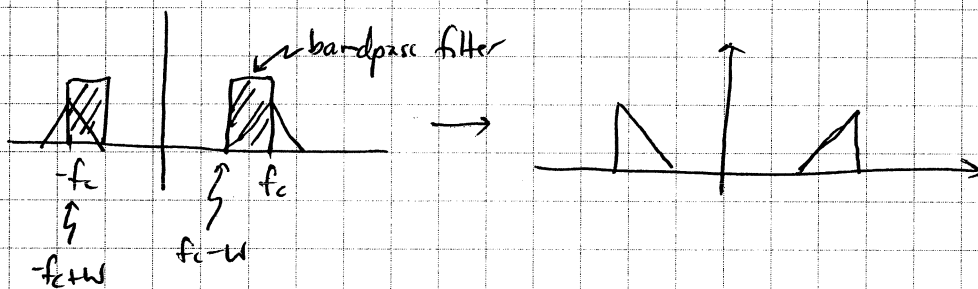
- ① Motivation for single-sideband modulation
- ② Crude solution
- ③ Elegant solution due to Hartley
- ④ Implementation & generalization.



- Each copy has a bandwidth of $2W$

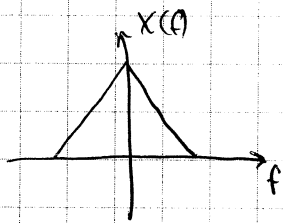
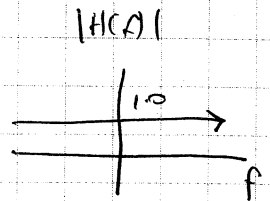
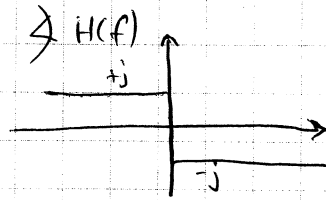
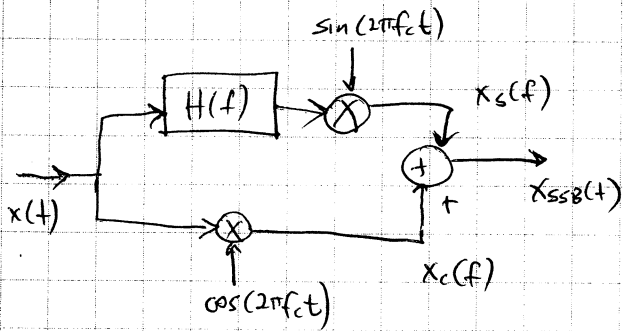
② - We would like, for spectrum efficiency, is for each ~~filter~~ copy to only have a bandwidth W , which is where all the information resides for a real signal.

② Filter $x_{mod}(t)$ with a sharp filter to remove the sidebands you don't want

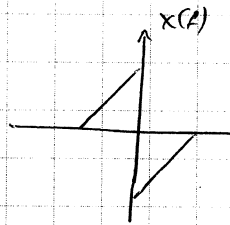


* Requires extremely sharp filters with very high accuracy.

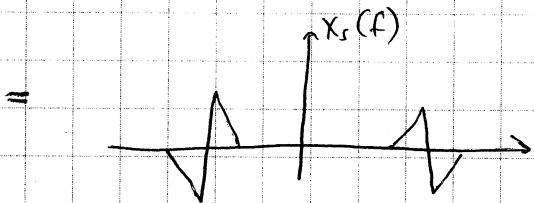
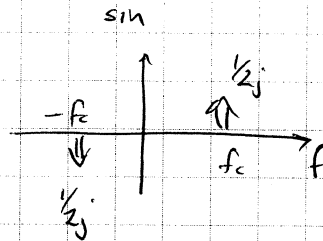
3



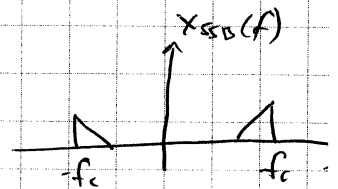
H(f)



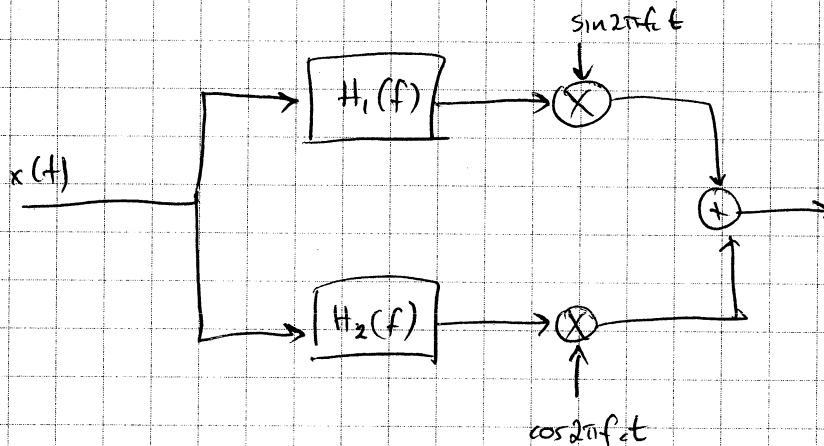
*



When combining with $x_c(f)$, which is computed similarly, we get



4



Over a range of frequencies, create $|H_1(f)| = |H_2(f)|$; $\angle H_1(f) - \angle H_2(f) = -90^\circ$.