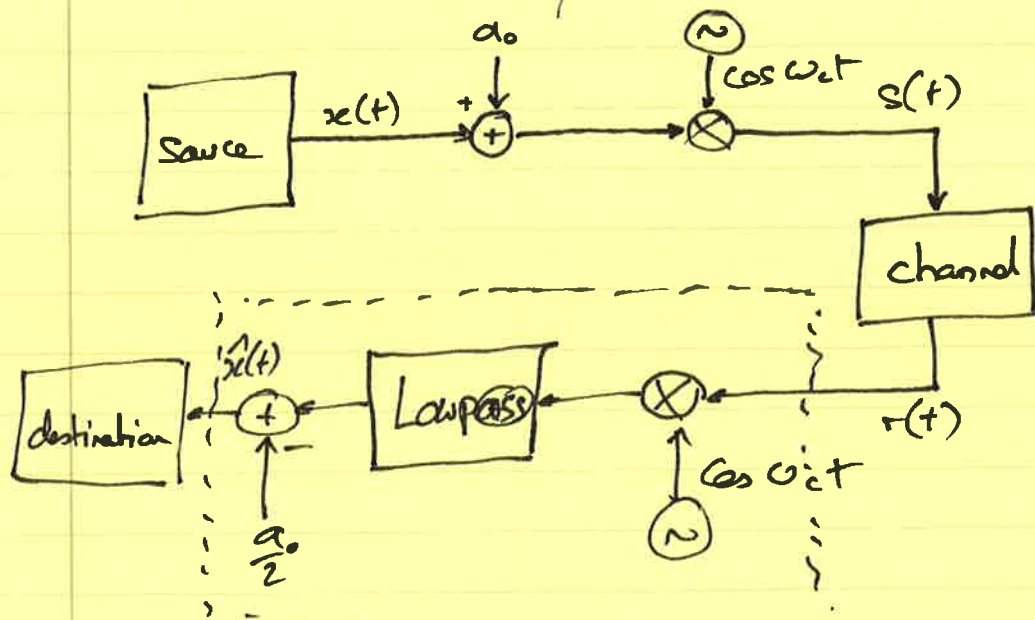


AM transmitter / receiver



assuming that the channel is distortionless and noiseless

$$\begin{aligned}
 \hat{x}(t) &= \text{Lowpass} \left[(a_0 + x(t)) \cos^2 \omega_c t \right] - \frac{a_0}{2} \\
 &= \text{Lowpass} \left[(a_0 + x(t)) \left(\frac{1}{2} + \frac{1}{2} \cos 2\omega_c t \right) \right] - \frac{a_0}{2} \\
 &= \frac{a_0}{2} + \frac{1}{2} x(t) - \frac{a_0}{2} = \frac{1}{2} x(t)
 \end{aligned}$$