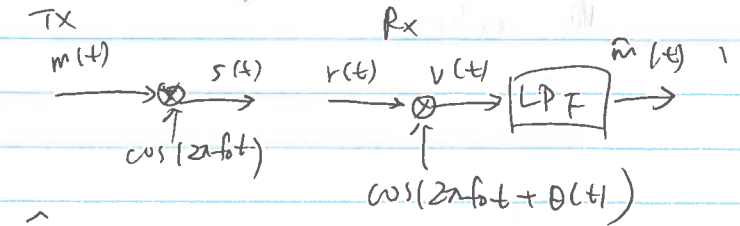
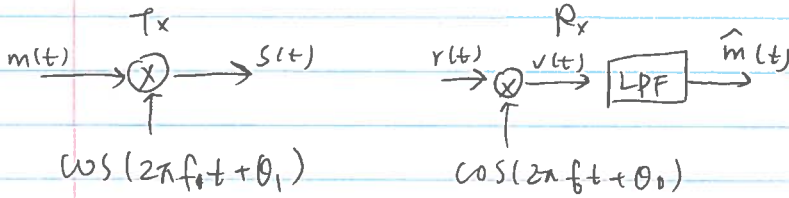


Homework

Problem 6.1

6-1 • Cordell Phase Recovering



$f_0 + f_1$ are close in value

relative error $\left| \frac{f_1 - f_0}{f_1} \right| < 10^{-4}$

with $r(t) = s(t)$

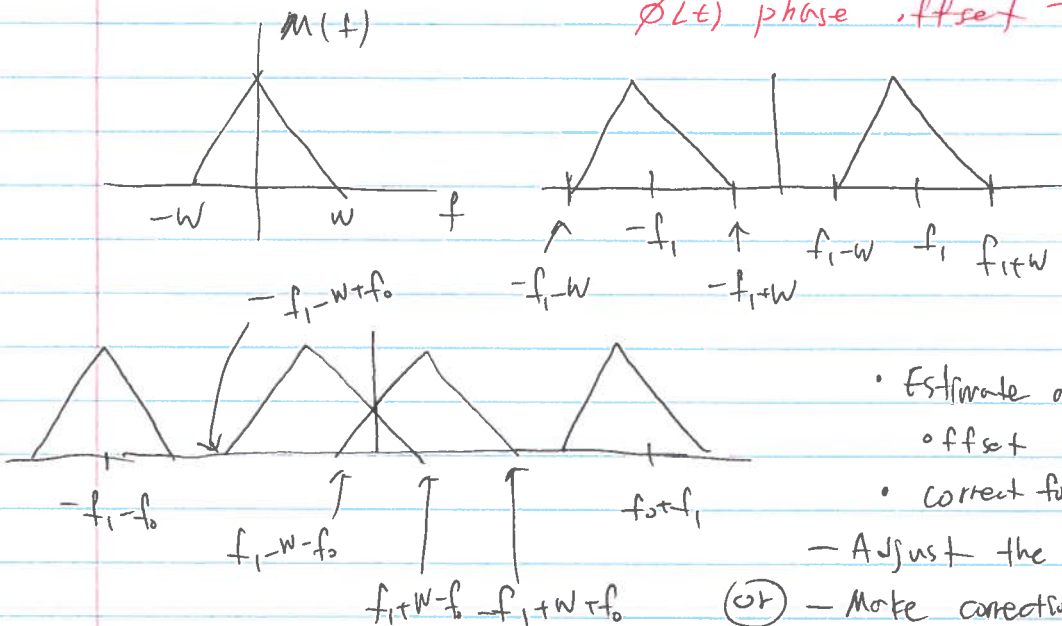
$v(t) = m(t) \cos(2\pi f_1 t + \theta_1) \cos(2\pi f_0 t + \theta_0)$

Trig. Identity $\cos u \cos v = \frac{1}{2} (\cos(u-v) + \cos(u+v))$

$v(t) = \frac{1}{2} m(t) \left(\cos(2\pi(f_1 - f_0)t + (\theta_1 - \theta_0)) \right)$ low freq.
 $+ \cos(2\pi(f_1 + f_0)t + (\theta_1 + \theta_0)) \right)$ high freq.

$\hat{m}(t) = \frac{1}{2} m(t) \cos(2\pi(f_1 - f_0)t + (\theta_1 - \theta_0))$

$\phi(t)$ phase offset \rightarrow want $\phi(t) = 0$.



- Estimate and track the phase offset
- correct for phase offset

- Adjust the receive oscillator phase

(or) - Make correction in software after LPF and LPF may need larger BW of $W + |f_0 - f_1|$

For software approach, LPF BW is $W + |f_0 - f_1|$