

# EE 132A

## Homework 4 (partial)

Due Monday March 3, 2008

Work all TBD problems.

**Problem 1.** Proakis & Salehi 6.3 except replace  $S_m(f)$  in Figure P-6.3 with

$$S_m(f) = P_0 \Lambda\left(\frac{f - f_c}{W}\right) + P_0 \Lambda\left(\frac{f + f_c}{W}\right).$$

**Problem 2.** Proakis & Salehi 6.5 except change the modulation index from 0.5 to 0.7 and in Figure P-6.5 (b) change 1500 to 1250.

**Problem 3.** Proakis & Salehi 6.8 except in part (4) change the modulation index to 0.7 and change the normalized message power to 0.25.

**Problem 4.** Suppose an AM communication signal has  $R_m(\tau) = 8\text{sinc}^2(5000\tau)$  and  $|m(t)| \leq 4$ . The channel the signal is transmitted over has 60 dB attenuation and the noise has spectral density  $S_n(f) = \frac{N_0}{2} = 10^{-10}$  W/Hz. We want the output of the demodulator at the receiver to be 45 dB. Find the required transmit power and bandwidth for the following cases.

- a. DSB-SC AM.
- a. SSB AM.