
Homework 8

Due: Thursday, November 1, 2007, at 5pm
Homework GSI: Mary Knox

Reading OWN Chapter 8.

Practice Problems (*Suggestions.*) OWN 8.8, 8.20, 8.44.

Problem 1 (*Effects from loss of synchronization.*)

OWN Problem 8.47

Problem 2 (*Asynchronous demodulation.*)

OWN Problem 8.26.

Problem 3 (*Single-sideband amplitude modulation.*)

OWN Problem 8.29.

Problem 4 (*Quadrature multiplexing.*)

OWN Problem 8.40

Problem 5 (*Intersymbol spacing.*)

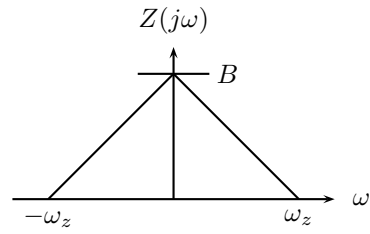
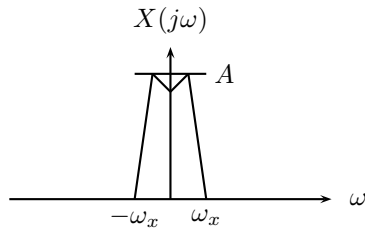
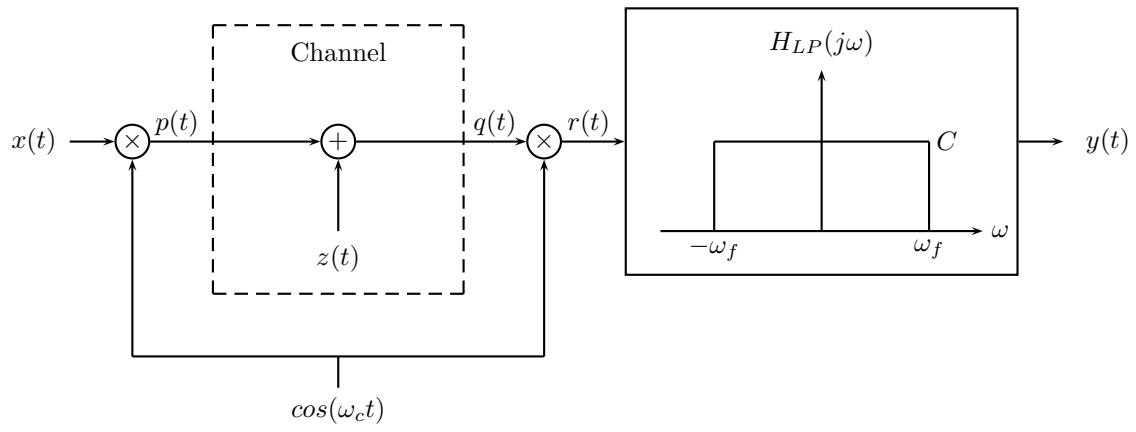
OWN Problem 8.13

Problem 6 (*Signal transmission system.*)

The transmission system depicted below is intended to allow a signal $x(t)$ to be transmitted through a communication channel that also carries other signals represented by $z(t)$.

Both $x(t)$ and $z(t)$ are bandlimited, and their Fourier transforms $X(j\omega)$ and $Z(j\omega)$ are real, as sketched below. Notice that the bandwidth ω_z of $Z(j\omega)$ is much greater than the bandwidth ω_x of $X(j\omega)$.

- (a) We wish to determine parameters for the transmission system so that the output $y(t)$ is equal to the input $x(t)$. Determine the range of ω_c for which $y(t)$ can be made equal to $x(t)$. Explain.
- (b) Given a value of ω_c in the range specified in part (a), determine the range of values of ω_f and the value of C for which $y(t) = x(t)$. Your expression may contain ω_c and/or parameters of the Fourier transforms $X(j\omega)$ and $Z(j\omega)$. Briefly explain your reasoning.



Problem 7 (FSK.)

OWN 8.39