

Spring 2009
EE 4601: Assignment 8

- Date Assigned: April 9, 2009.
 - Date Due: April 21, 2009.
1. text problem 6.33
 2. text problem 6.34
 3. text problem 6.36
 4. OFDM systems are known to be resilient to timing errors. Suppose that the OFDM complex envelope

$$\tilde{s}(t) = A \sum_{n=0}^{N-1} x_n e^{-j \frac{2\pi n t}{T}}$$

is sampled at time instants $t = kT_s + \Delta_t$, where Δ_t is a timing offset, to yield the samples

$$R_k = \tilde{s}(kT_s + \Delta_t), k = 0, \dots, N - 1$$

and an N -point FFT is taken on the samples $\{R_k\}_{k=0}^{N-1}$ to yield the coefficients $\{Z_n\}_{n=0}^{N-1}$.

Assume that the timing offset Δ_t lies somewhere in the OFDM guard interval such that all N FFT coefficients belong to the same OFDM block. Determine the FFT coefficients $\{Z_n\}_{n=0}^{N-1}$.