Table of Contents for Chapter 6

Statistical Pulse Trains

6.1. The Autocorrelation Function 1
(a) autocorrelation function for a Square Pulse 1
(b) the Spectral Density Connection: Wiener-Khintchine 2
(c) verification of W-K for a Square Pulse 2

6.2 Autocorrelation Function for a Pulse Train 3
(a) Spectral Density of a Pulse Train 3
(b) Autocorrelation Function for a Pulse Train 4

6.3 Statistical Pulse Trains 5
(a) The Spectrum of a Pulse Train when pulses are not correlated. 7
(b) Chen's Upshift Formulas for Modulation 8

6.4 Dealing with statistical coefficient averages 9
(a) Pulse Train with Random Coefficients 10
summary box 10

6.5 A View from the High Ground 11
(a) rederivation of $<|X(\omega)|^2>$ 12
(b) derivation of $<X(\omega)>$ 12
(c) derivation of $<\phi(\omega)>$ 13

6.6 Application to Standard Pulse Train Types 14
(a) NRZ line code 14
(b) RZ line code 15
(c) Manchester line code 16
(d) AMI line code 17

6.7 More applications 20
(a) power spectrum of NRZ 20
(b) power spectrum of MPSK 21
(c) power spectrum of QAM 24
(d) power spectrum of bipolar NRZ 25
(e) power spectrum of bipolar MSK 25