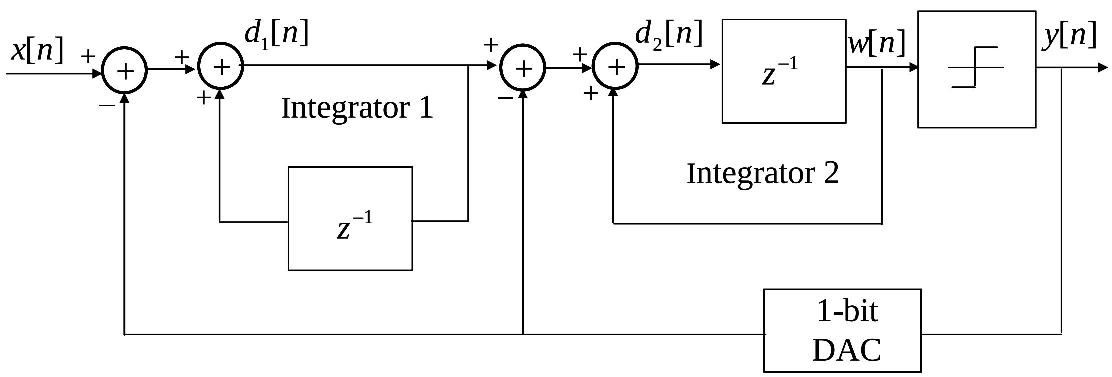
Errata for Contemporary Communication Systems, 1st Edition

Location	Change	to the following
Chapter 2		
p. 25, Section 2.1, 1st para	Figure 2.1(a) and (b)	Figures 2.1(a) and (b)
p. 48, 1st paragraph	$f = nf_o, n = 0,1,2,3,\ldots$	$f = \pm nf_o, n = 2,3,\ldots$
p. 48, 2nd paragraph	$f = nf_o$	$f = \pm nf_o$
p. 54, 2nd paragraph, 2 places	$n \to \infty$	$N \to \infty$
p. 57, 1st paragraph, last line	sinusoid	exponential signal
p. 81, 1st paragraph	M-file	MATLAB
p. 81, 2nd paragraph	M-files	functions
p. 81, 3rd paragraph	M-file	MATLAB
p. 95, 1st paragraph, 2 places	m-file	function
p. 99, Problem 2.15	Figure 2.24	Figure 2.23
p. 99, Problem 2.16	with duty cycle 50%	delete
p. 99, Problem 2.16, part(b)	99%	98%
Chapter 4		
p. 173, 1st paragraph, 4th line	W_T	B_T
p. 199, Problem 4.1	$c(t) = \cos(3600\pi t)$	$c(t) = \cos(36000\pi t)$
p. 199, Problem 4.1, part (c)	$s_2(t) = \cos(600\pi t)\sin(1800\pi t)$	$s_2(t) = \cos(600\pi t)\cos(1800\pi t)$
p. 200, Problem 4.8, part (a)	$x(t) = \text{sinc}(t)$	$x_1(t) = \text{sinc}(t)$
p. 200, Problem 4.9	BP	HP or BP
p. 200, Problem 4.10	delete Part (c)	
p. 201, Problem 4.17	$s_1(t) = \cos(30\pi \times 10^3)$	$s_1(t) = \cos(30\pi t \times 10^3)$
	$s_2(t) = \cos(\pi \times 10^6)$	$s_2(t) = \cos(\pi t \times 10^6)$
	$s_3(t) = \cos(4\pi \times 10^6)$	$s_3(t) = \cos(4\pi t \times 10^6)$
p. 204, 2nd line from bottom	If $x(t)$ and $y(t)$	**4.** If $x(t)$ and $y(t)$
Chapter 5		
p. 217, Figure 5.5 (a)		Add *y*-axis label $S(f)$
p. 218, equation below Table 5.2	≈0.99	≈0.98
p. 242, Figure 5.25, *x*-axis label	(*n* sec)	(*n*sec)
p. 274, Problem 5.1	$k_f = 30$ and $k_p = 10\pi$	$k_f = 30$ Hz/V and $k_p = 10\pi$ radians/V
p. 274, Problem 5.6, part (b)	spectral density	spectrum
p. 274, Problem 5.7, part (a)	spectral density	spectrum
p. 275, Problem 5.13, part (b)	Capture	Hold-in
p. 276, Problem 5.17	where $\Delta f_{\max}$ peak frequency deviation.	where the frequency of the modulating signal is f_m.
p. 276, Problem 5.17, part (b)	peak phase deviation	peak phase error

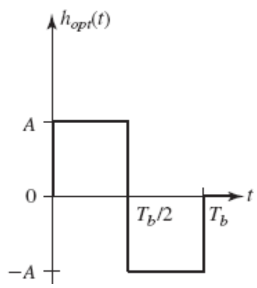
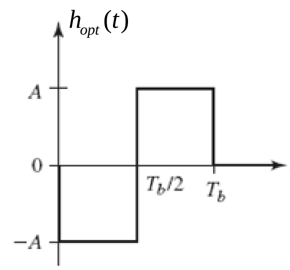
Location	Change	to the following
Chapter 6		
p. 283, 2 lines above (6.16)	If an event occurs	If an event *A* occurs
p. 322, Equation (6.176)	$\det \begin{vmatrix} \frac{\partial x}{\partial v} & \frac{\partial x}{\partial w} \\ \frac{\partial y}{\partial v} & \frac{\partial y}{\partial w} \end{vmatrix}_{x=g^{-1}(v,w),\, y=h^{-1}(v,w)}$	$\det \begin{pmatrix} \frac{\partial x}{\partial v} & \frac{\partial x}{\partial w} \\ \frac{\partial y}{\partial v} & \frac{\partial y}{\partial w} \end{pmatrix}_{x=g^{-1}(v,w),\, y=h^{-1}(v,w)}$
p. 322, line following (6.176)	$\det\lvert A\rvert$	$\det\left(\underline{A}\right)$
p. 322, line following (6.176)	matrix A	matrix $\underline{A}$
p. 328, Figure 6.20 axes labels	*x*	*x*/*A*
p. 344, Equation (6.270)	$G_{\mathbf{x}}(f+f_c)-G_{\mathbf{x}}(f-f_c)$	$G_{\mathbf{x}}(f-f_c)-G_{\mathbf{x}}(f+f_c)$
p. 359, Section 6.14.4, 5th line	$\mathscr{L} = 3$ dB	$L = 3$ dB
p. 365, Problem 6.6, part (e)	$P\left\{-1 \le \lvert \mathbf{x}-2\rvert \le 1\right\}$	$P\left\{-1 \le \mathbf{x}-2 \le 1\right\}$
p. 366, Problem 6.19	$\underline{\mathbf{z}} = \underline{A}\underline{\mathbf{x}}+\underline{b}$	$\underline{\mathbf{y}} = \underline{A}\underline{\mathbf{x}}+\underline{b}$
p. 366, Problem 6.23, 1st line	another	a WSS
p. 367, Problem 6.31	$G_{\mathbf{x}}(f+f_c)-G_{\mathbf{x}}(f-f_c)$	$G_{\mathbf{x}}(f-f_c)-G_{\mathbf{x}}(f+f_c)$
Chapter 7		
p. 383, 2nd line from bottom	(7.43)	(7.44)
p. 397, 2nd equation from bottom	$P_T = -4+50 = 46 = 39.81$ W	$P_T = -4+50 = 46$ dBm = 39.81 W
p. 402, Equation (7.103)	$\left(SNR_{FM}\right)_{th} = 30D^2(D+1)$	$\left(SNR_{FM}\right)_{th} = 60D^2(D+1)\overline{\mathbf{s}_n^2}$
p. 405, Equation (7.106)	$P_{\mathbf{n}_{FM}} = \int_{-B}^{B} \mathbf{G}_{\mathbf{n}_{FM}}(f)df$	$P_{\mathbf{n}_{FM}} = \int_{-B}^{B} G_{\mathbf{n}_{FM}}(f)df$
p. 407, Example 7.7, 2nd line	$= 20\log_{10}(7.5) - 4.77$	$= 20\log_{10}(7.14) - 4.77$
p. 411, 2nd line following (7.119)	equivalent noise	noise-equivalent
p. 412, Equation (7.121)	$\left(CNR_{out}\right)_1 = \frac{P_T}{(N_{out})_1} = \frac{P_T}{FG_aN_oB_N}$	$\left(CNR_{out}\right)_1 = \frac{P_T}{(N_{out})_1} = \frac{P_T}{F\mathscr{G}N_oB_N}$
p. 416, Problem 7.2	$N_o/2 = 10^{-7}$	$N_o/2 = 10^{-10}$
p. 416, Problems 7.3 and 7.4	$N_o/2 = 10^{-8}$	$N_o/2 = 10^{-10}$
p. 417, Problem 7.14	(i) the transmitted power or (ii) *D* (that is, the transmission bandwidth) as much as possible.	(i) *D* (that is, the transmission bandwidth) and/or (ii) the transmitted power.
p. 417, Problem 7.14, part (b)	SNR of 50 dB? What are the corresponding values of *D* and the transmission bandwidth?	SNR of 50 dB subject to the constraint that the channel bandwidth is limited to 250 kHz ? What is the corresponding values of *D*?
p. 418, Problem 7.15, part (d)	taking preemphasis	taking 75 μsec preemphasis

Location	Change	to the following
Chapter 8		
p. 433, 6th line from bottom	(8.23)	(8.28)
p. 441, Figure 6.20, *y*-axis labels	001 following 001	000
p. 441, equation in 1st paragraph	$a_{m-1}a_1 2^{-(m-1)}$	$a_{m-1}2^{-(m-1)}$
p. 446, 5th line above (8.41)	0.064%	0.0032%
p. 446, 3rd line above (8.41)	0.9544	0.999936
p. 453, 1st paragraph	range on input	range of input
p. 481, 6th line from bottom	LP	BP
p. 485, Problem 8.3, part (b)	Nyquist frequency	Nyquist rate
p. 485, Problem 8.3	Add part (d)	Repeat (a) and (b) if the duty cycle was 10%.
p. 486, Problem 8.10, part (a)	SNR	SQNR
p. 486, Problem 8.11, line 2	sinusoidal	a Gaussian
p. 486, Problem 8.14, part (b)	$f_L = 47,\ f_H = 53$	$f_L = 40,\ f_H = 50$
p. 486, Problem 8.14, part (c)	$f_L = 50,\ f_H = 75$	$f_L = 55,\ f_H = 75$
p. 487, Problem 8.19, part (d)	3.5 bits	2.5 bits
p. 487, Figure P8.3	See revised figure below	

Figure P8.3 (revised)



Location	Change	to the following
Chapter 9		
p.489, 9.3, 1st line	The spectral density	An expression for the spectral density
p.490, 9.5, 1st line	spectral and	spectral density and power
p.491, 3rd line	$(b_{n-1}, b_n) \rightarrow a_n \in \mathscr{A}_4 = \{-3, -1, -1, 1\}$	$(b_{n-1}, b_n) \rightarrow a_n \in \mathscr{A}_4 = \{-3, -1, 1, 3\}$
p.497, 3rd line following (9.29)	first null in the envelope of the	first null in the
p.506, Section 9.4	first null in the envelope of the	first null in the
p.513, Table 9.4, last line	667312	6673
p.514, 2nd line above (9.61)	another PN generator	an identical PN generator
p.521, Figure 9.30, *y*-axis label	$V_{RC}(t)$	$v_{RC}(t)$

Location	**Change**	**to the following**
Chapter 10		
p. 535, Eq. (10.16), line 1	$\frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}\Big\vert_{\phi(u)}^{\infty} = -\frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}\Big\vert_{x=\phi(u)} \frac{d\phi(u)}{du}$	$= -\frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}\Big\vert_{x=\phi(u)} \frac{d\phi(u)}{du}$
p. 541, Figure 10.5(b)		
p. 542, 1st line	matched detector filter	matched filter detector
p.546, Figure 10.7 (b), *y*-axis label	$\hat{a}_n$	$\hat{b}_n$
p. 569, 2nd line following (10.124)	to interchangeably	to
p. 571, Eq. (10.135), line 1	$\int_T r(u)\phi_j(t-T+u)du\Big\vert_{t=T}$	$\int_T r(u)\phi_j(T-t+u)du\Big\vert_{t=T}$
p. 586, Problem 10.8, Figure P10.3	T_b	T
p. 587, Problem 10.10, 1st line	Figure 10.4(a)	Figure P10.4(a)
p. 587, Figure P10.4(a)	$\sqrt{T_b}$	$1/\sqrt{T_b}$
p. 587, Figure P10.4(a)	$3T_b / 4T_b$	$3T_b / 4$
p. 587, Problem 10.11, 1st line	function	functions
p. 587, Problem 10.11, 2nd line	corresponding the points	corresponding to points
Chapter 11		
p. 623, 2nd line	direct	in-phase
p. 627, 2nd line	using	using closed-form solution for
p. 674, Problems 11.4–11.6, 1st line	01001011101	0100101110
p. 674, Problem 11.8, 1st line	Problem 11.6	Problem 11.7
p. 675, Problem 11.12, part(d)		delete
p. 675, Problem 11.13, part(c)	$E_b / N_o = 22$ dB	$P_e < 10^{-9}$
p. 675, Problem 11.15, part(d)	mapping table ..… branches.	mapping tables for in-phase and quadrature branches.
p. 675, Problem 11.16, part(c)	SNR	E_b / N_o
p. 675, Problem 11.18, part(a)	bock	block
Chapter 12		
p. 704, line before (12.83)	SRRC	RRC
p. 726, 5th line following (12.148)	FFB	FBE

Location	Change	to the following
p. 735, Problem 12.6, part(d)	fifth bit	fourth bit
p. 735, Problem 12.7, part(d)	an upper-bound expression	an expression
Chapter 13		
p. 755, 4th line above (13.5)	PSK signal sets	PSK signals $\left(M = 2^k, k > 2\right)$
p. 760, 1st line following (13.18)	equivalent noise	noise-equivalent
p. 766, end of 2nd paragraph	receiving filter output	MF/Equalizer output
p. 782, 2nd line above (13.61)	$v(k)$	v_k
p. 782, Equation (13.61)	$R_c(k) \equiv \sum_{i=0}^{N-1} c_i c_{(i+k)_{\text{mod } N}}$	$R_c(k) \triangleq \frac{1}{N} \sum_{i=0}^{N-k-1} c_i c_{i+k}$
p. 785, Problem 13.5, 4th line	50 ppm	±50 ppm
p. 786, Problem 13.11, 2nd line	normalized loop	normalized loop bandwidth
p. 786, Problem 13.11, part(b)	squaring loop.	squaring loop filter.
Chapter 14		
p. 791, Equation (14.6), 1st line	$\log_2 p_{\mathbf{x}}(x_i) p_{\mathbf{y}}(y_j)$	$\log_2 \left(p_{\mathbf{x}}(x_i) p_{\mathbf{y}}(y_j) \right)$
p. 802, Equation (14.37), 2nd row	$p_{21} \quad p_{22} \quad \cdots \quad p_{21N}$	$p_{21} \quad p_{22} \quad \cdots \quad p_{2N}$
p. 805, line following (14.48)	$H(\mathbf{x}) \le q$	$H(\mathbf{x}) \le \log_2 q$
p. 806, Example 14.13, 1st line	$p_{\mathbf{x}}(0) = \alpha$ and $p_{\mathbf{x}}(1) = 1 - \alpha$	$p_{\mathbf{x}}(0) = p$ and $p_{\mathbf{x}}(1) = 1 - p$
p. 817, Section 14.4, 1st line	$(R < C)$	$(R_b < C)$
p. 817, Equation (14.95)	$\frac{R}{W} < W \log_2 \left(1 + \frac{E_b R}{N_o W} \right)$	$\frac{R_b}{W} < W \log_2 \left(1 + \frac{E_b R_b}{N_o W} \right)$
p. 817, line following (14.95)	$\eta = R / W$	$\eta = R_b / W$
p. 818, Figure 14.20	Revised (see next page)	
p. 818, Figure 14.22	Symbol / Codeword: a 0 b 10 c 11 d 110 e 111	Symbol / Codeword: a 00 b 01 c 10 d 110 e 111
p. 821, Example 14.18, part(c)	the volume … sphere entropy	the entropy
p. 830, Example 14.23, 2nd line	TO_BE_OR_NOT_TO_BE_ THAT_IS_THE_ QUESTION	84 79 45 66 69 45 79 82 45 78 79 84 45 256 258 260 84 72 65 267 73 83 268 257 259
p. 847, Problem 14.1, 1st line	source emits	source $\mathbf{x}$ emits
p. 847, Problem 14.4, part(b)	$P(i\Delta)$	$p_{\mathbf{x}_Q}(i\Delta)$
p. 847, Problem 14.4, part(c)	quantized source.	quantized source $\mathbf{x}_Q$.

Location	Change	to the following
Chapter 15		
p. 856, Section 15.1, 1st paragraph	R	R_b
p. 865, Equation (15.22)	$P(\underline{y}\|\underline{x}_\ell) \ge P(\underline{y}\|\underline{x}_m), \quad \ell \ne m$	$P(\underline{y}\|\underline{x}_\ell) \ge P(\underline{y}\|\underline{x}_m), \quad m \ne \ell$
p. 869, Equation (15.31), 2nd line	$\binom{n}{2} p^4 (1-p)^{n-4}$	$\binom{n}{4} p^4 (1-p)^{n-4}$
p. 882, line following (15.68)	$K = E_{cb} + \sum_{j=0}^{n-1} \boldsymbol{r}_j^2$	$K = nE_{cb} + \sum_{j=0}^{n-1} \boldsymbol{r}_j^2$
p. 883, line following (15.75)	minimum weight of a codeword	minimum weight of the code
p. 902, Equation (15.117), 2nd line	$D^7(K^5 + K^6 + K^7)J^3 + ...$	$D^7(K^5 + 2K^6 + K^7)J^3 + ...$
p. 903, Equation (15.123), 1st line	$(3 \cdot 3)D^7$	$(3 \cdot 4)D^7$
p. 903, line following (15.123)	does affect	does not affect
p. 903, 3rd line following (15.123)	a path	two paths
p. 903, 4th line following (15.123)	two-bit	four decoded bit
p. 914, Figure 15.30 QPSK part	$\Delta_o = d_{\min} = 0.765$	$\Delta_o = d_{\min} = \sqrt{2}$
p. 921, Problem 15.3, part(d)	(110101)	(010101)
p. 921, Problem 15.3, part(e)	(011101)	(001101)
	(101101)	(111101)

Figure 14.20 (revised)