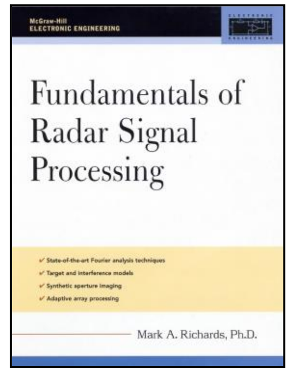
Errata for all Printings Except the 3rd Printing



Fundamentals of Radar Signal Processing

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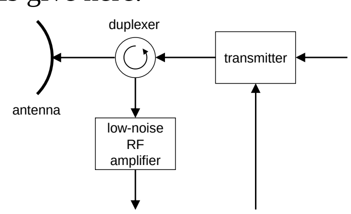
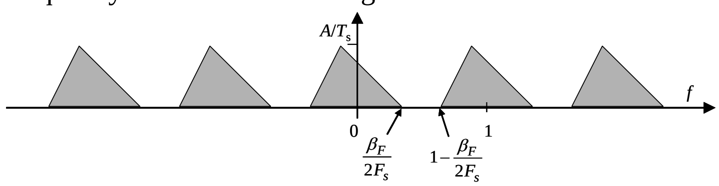
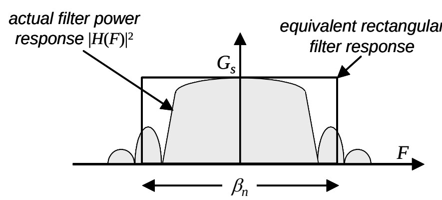
McGraw-Hill, New York, 2005

Note: The author wishes to thank the many students and readers who have helped to identify errata in the text. The responsibility for all errors, both those that have been found and those yet to be found, lies entirely with the author.

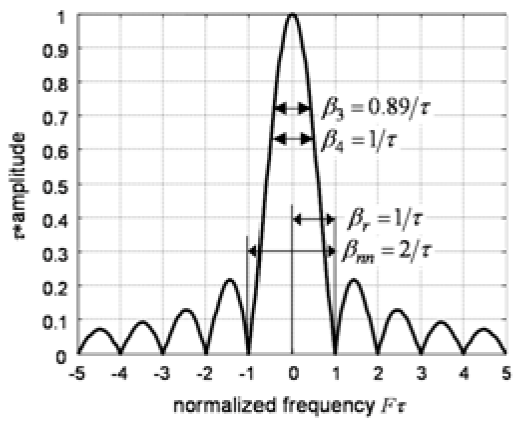
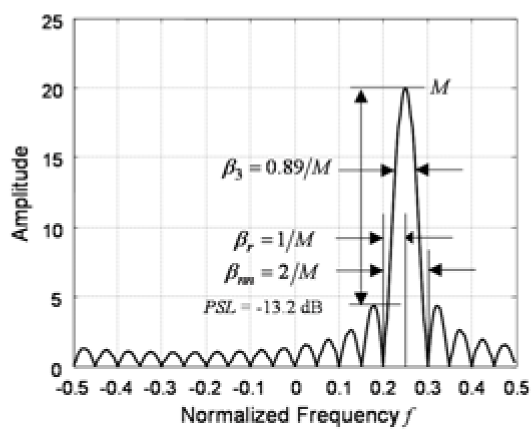
Page	***Location on Page***	***Correction***
Back Cover	"Develop In-Depth Understanding" box	The topic of Tracking is not covered in this text. (Maybe in the second edition!) *Note: The cover was corrected to remove this error, as well as to improve other aspects, for the second printing.*
xxiii	last line	Change "… staggered set of PRFs" to "… staggered PRFs"
3	2nd line prior to Eqn. 1.1	It should read "… $A(t) > T(t)$ ..." instead of "… $y(t) > T(t)$ ...".
6	Fig. 1.2	The direction of the arrow in the circulator symbol is incorrect. A portion of the figure showing the corrected arrow is give here: 
11	Fig. 1.5	Labels on vertical axis should be $\pm D_y/2$, not $\pm D_y/\lambda$
11	2nd line after Eq. 1.6	Change $\hat{E}(s)=E\left(\sin^{-1}\theta\right)$ to $\hat{E}(s)=E\left(\sin^{-1}(s)\right)$.
11	Eq. 1.7	Sign of the exponential argument should be negative. The corrected equation is $$A(\lambda\zeta)=\int_{-\infty}^{+\infty}\hat{E}(s)e^{-j2\pi\zeta s}ds$$
11	2nd line prior to Eq. 1.8	Change "…$A(z) = A_0$." to "…$A(y) = A_0$."
12	last line	Change "… *tapering* of" to "*tapering* or"

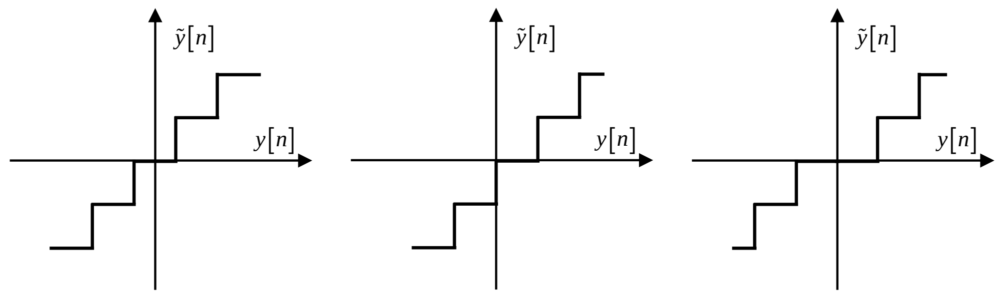
Page	***Location on Page***	***Correction***
14	1st paragraph, last line	Change "… $z \neq 0$, …" to "… $x \neq 0$, …"
21	Fig. 1.14	The equations for the ranges of the two targets mix time and range units. The two targets are at ranges R_0-ΔR and R_0, corresponding to time delays $2R_0/c$-τ and $2R_0/c$.
30	Eq.(1.41	A scale factor of $(1/T_s)$ is missing. The corrected equation is $$X_s(U) = \frac{1}{T_s}\sum_{k=-\infty}^{+\infty} X\left(U - \frac{k}{T_s}\right) = \frac{1}{T_s}\sum_{n=-\infty}^{+\infty} X(U - kF_s) \qquad (1.41)$$ which is consistent with the labeling of Fig. 1.19 (p. 29).
30	1st line after Eq. 1.41	Change ".. $F_s = 1/T$ ..." to ".. $F_s = 1/T_s$ ...".
30	Eq. 1.42	Change $n \in [-\infty, \infty]$ to $n \in (-\infty, \infty)$
31	Fig. 1.20	The abscissa should be labeled with the normalized frequency *f* instead of the absolute frequency *U*. The corrected figure is 
32	Footnote	The MATLAB non-conjugate transpose operator is incorrectly typeset. The last sentence of the footnote should read as follows: "The MATLAB™ operator .' performs a non-conjugate transpose."
36	Eq. 1.66	$s_{xy}[k] = s^*_{yx}[-k]$, not $s^*_{xy}[-k]$
40	Fig. 1.24	Change caption from ".., radar signal processing" to "… radar signal processing is performed."
41	2nd paragraph, 2nd line	Change "… is developed." to "… are developed."
53	1st paragraph, 12th line	Change "… such as detecting aircraft …" to "… such as detecting when aircraft …"
57	1st line after Eq. 2.12	Change "… 1. nW …" to "… 3.07 nW …"
60	Eq. 2.24	$\sin\phi$ term missing from the differential in the integrand. The corrected equation is $$\iint P^2(\theta,\phi)\sin\phi\, d\theta\, d\phi \cong \frac{\pi\theta_3\phi_3}{8\ln 2}G^2 = 0.57\theta_3\phi_3 G^2$$
63	Eq. 2.31	Delete $d\phi$ from the second and third forms. The corrected equation is $$dA = R_0\, d\theta \cdot \frac{\Delta R}{\cos\delta} = \frac{R_0 \Delta R}{\cos\delta}\, d\theta$$

Page	Location on Page	Correction
65	Eq. 2.37	Should be transmitted, not backscattered, **E**-field components on the right hand side of the second line. In addition, the individual components of the vector should not be boldface, since they are scalars. The corrected equation is $\begin{bmatrix} E_H^b \\ E_V^b \end{bmatrix} = \begin{bmatrix} S_{HH} & S_{HV} \\ S_{VH} & S_{VV} \end{bmatrix} \begin{bmatrix} E_H^t \\ E_V^t \end{bmatrix} = \mathbf{S} \begin{bmatrix} E_H^t \\ E_V^t \end{bmatrix}$
66	Eq. 2.41	m^2+2, not m^2+1 in the denominator. Corrected equation is $K = \dfrac{m^2 - 1}{m^2 + 2}$.
73	Table 2.3, entry for chi-square of degree 4 pdf	This is not an error, just a comment: Calling this a 4th-degree chi-square pdf is somewhat non-standard terminology. A chi-square of degree N is usually considered to be a special case of the gamma pdf $\Gamma(\alpha,\beta)$ with $\alpha = N/2$ and $\beta = 2$. This pdf is $\Gamma(2,\bar{\sigma}/2)$, which is 4th degree but does not have $\beta = 2$. This can also be considered a special case of the Erlang-k distribution, $E(k,\lambda)$ (which is itself a special case of the gamma) with $k = 2$ and $\lambda = 1/\bar{\sigma}$.
73	Table 2.3, entry for Rice pdf	First column: change "Rice or Rician, noncentral chi-square of degree 2" to just "Noncentral chi-square of degree 2". Add the following at the end of the "comment" column: "$I_0(\cdot)$ is the modified Bessel function of the first kind and zero order."
76	Table 2.4, entry for Chi-square of degree 4	The expression for the mean of ς is incorrect; change it to $\bar{\varsigma} = \dfrac{3}{4}\sqrt{\dfrac{\pi\bar{\sigma}}{2}}$.
76	Table 2.4, entry for Rice pdf	First column: change "Rice or Rician, noncentral chi-square of degree 2" to just "Rice or Rician".
78	Eq. 2.59	Amplitude factors A and A^* are not correctly included. The corrected equation is $s_{\bar{y}}(\Delta z) = \int_{-\pi/\alpha}^{\pi/\alpha} \bar{y}(t;z)\,\bar{y}^*(t;z+\Delta z)\,dz = \int_{-\pi/\alpha}^{\pi/\alpha} \left\{ A e^{j\Omega(t-2R_0/c)} \sum_{n=-M}^{M} e^{-j\alpha zn} \right\} \cdot \left\{ A^* e^{-j\Omega(t-2R_0/c)} \sum_{l=-M}^{M} e^{+j\alpha(z+\Delta z)l} \right\} dz$
81	Last paragraph	Change "… 500 samples …" to "… 120 samples …"
81	2nd-to-last line	Change "…(chi-square pdf, …" to "…(4th-degree chi-square pdf, …"
82	Fig. 2.15	The label on the vertical axis should be 'Power", not "Amplitude".
82	Figs. 2.14 and 2.15 captions	Change "500 samples …" to "120 samples …" in both captions.

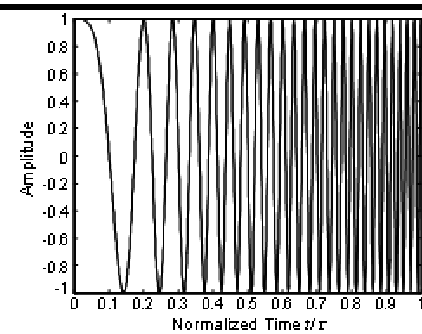
Page	Location on Page	Correction
84	Eq. 2.66	*SCR* for the pulse-limited area clutter case falls off as *R*, not R^3. Thus the corrected equation for this case is $SCR = \frac{\sigma \cos\delta}{R\sigma^0 \Delta R \theta_3}$ (pulse-limited area clutter case) . (The other two cases given are correct as is.)
87	3 occurrences on page	Replace (“Sangston, 1997)” with (“Sangston, 1994)”.
89-90	Fig. 2.17 and text in last paragraph	Figure 2.17 depicts the receiver filter frequency response magnitude squared, $\lvert H(F)\rvert^2$, not just $H(F)$ as implied in the 3rd line of the last paragraph. The corrected figure appears as follows:  The 2nd sentence of last paragraph should read “… by the power transfer function $\lvert H(F)\rvert^2$ is used.” The first line on p. 90 should read “… where the receiver power gain G_s is defined as the maximum value of $\lvert H(F)\rvert^2$.”
93	Eq. 2.85 and the sentence preceding	Change the sentence and equation to read as follows: “This is simply $$F_D \equiv F_r - F_t = +\frac{2v}{c}F_t = +\frac{2v}{\lambda_t}$$
95	Eq. 2.90	The term *c* in the argument of the first exponential on the last line should be removed. The corrected equation is $$\bar{y}(t) = a\left(t - \frac{2(R_0 - vt)}{c}\right)\exp\left(j2\pi F_t\left(t - \frac{2(R_0 - vt)}{c}\right)\right)$$ $$\approx a\left(t - \frac{2R_0}{c}\right)\exp\left(-j\frac{4\pi}{\lambda_t}R_0\right)\exp\left(+j2\pi\left(\frac{2v}{\lambda_t}\right)t\right)\exp\left(j2\pi F_t t\right)$$
98	Eq. 2.102	Error in argument of $a(\cdot)$ in first line. The corrected equation (first line only) is $$\bar{y}_m(t) = a\left(t - mT - \frac{2(R_0 - vmT)}{c+v}\right)\exp\left(j2\pi F_t\left(t - \frac{2(R_0 - vmT)}{c+v}\right)\right)$$
98	Eq. 2.103	A constant phase term was omitted in going from the 2nd to the last line of the equation. The corrected equation (last line only, but also including the correction to the argument of the envelope $a(\cdot)$ in the next correction), is $$= a\left(\frac{2v}{c}mT\right)\exp\left[j2\pi\left(\frac{2v}{\lambda_t}\right)mT\right]\exp\left[-j\frac{4\pi v^2 mT}{\lambda_t c}\right]\exp\left[j\frac{4\pi v R_0}{\lambda_t c}\right]$$
98 – 99	Eq. 2.103, last line of p.98, and Eq. 2.105	Change $a\left(\frac{v}{c}mT\right)$ or $a(vmT/c)$ to $a\left(\frac{2v}{c}mT\right)$ or $a(2vmT/c)$ (5 total occurrences).
99	2nd paragraph, 4th line	Change “… with a frequency of $-2v^2T/\lambda_t c$ hertz.” To “… corresponding to a frequency of $-2v^2/\lambda_t c$ hertz.”

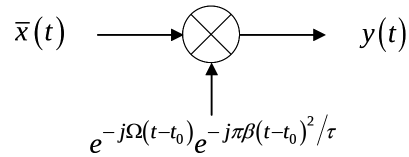
Page	***Location on Page***	***Correction***
100	last line before Eq. 2.106	Remove the period at the end of this line.
103	3rd line	Change "Chap. 7" to "Chap. 8".
103	Eq. 2.115	Differential *dR* is missing from integral, and 2nd line of equation is repeated on first line as well. The corrected equation is $$\hat{\rho}(\theta,\phi;R_0)=\int_R x\left(\frac{2}{c}(R_0-R)\right)\rho'(R,\theta,\phi)\,dR = \left[\rho'(R,\theta,\phi) *_R x\left(\frac{2R}{c}\right)\right]_{R=R_0}$$
103	Eq. 2.116	Incorrect variables in $\hat{\rho}$ term of integral. Corrected equation is $$y(\theta,\phi;R_0)=A_r\int_{\xi=-\frac{\pi}{2}}^{\frac{\pi}{2}}\int_{\varsigma=-\pi}^{\pi} P(\varsigma-\theta,\xi-\phi)\hat{\rho}(\zeta,\xi;R_0)\,d\varsigma\,d\xi = \hat{\rho}(\theta,\phi;R_0) *_\theta *_\phi P(\theta,\phi)$$
104	Eq. 2.117	Incorrect variables in $\hat{\rho}$ term of integral. Corrected equation is $$y(\theta,\phi;R_0)=A_r\int_{\xi=-\pi}^{\pi}\int_{\varsigma=-\frac{\pi}{2}}^{\frac{\pi}{2}} P(\varsigma-\theta,\xi-\phi)\hat{\rho}(\zeta,\xi;R_0)\,d\varsigma d\xi = \hat{\rho}(\theta,\phi;R_0) *_\theta *_\phi P(\theta,\phi)$$
104	Last line before Eq. 2.118	Change "$X = R_0\theta$" to "$X = R_0\xi$" and change "$Y = R_0\phi$" to "$Y = R_0\zeta$".
104	Eq. 2.118	Incorrect variables in $\hat{\rho}$ term of integral and on limits. Corrected equation is $$y(X,Y;R_0)=A_r\int_{\alpha=-\frac{\pi R}{2}}^{\frac{\pi R}{2}}\int_{\beta=-\pi R}^{\pi R} P\left(\frac{1}{R_0}(X-\alpha,Y-\beta)\right)\hat{\rho}\left(\frac{\alpha}{R_0},\frac{\beta}{R_0};R_0\right)d\alpha\,d\beta$$
107	Eq. 2.122	Change $x(t'-t)$ to $x(t-t')$ in the integrand.
107	2nd line before Section 2.7.3	Change "… scatterers Eq. (2.31) the voltage …" to "… scatterers (Eq. (2.31)) the voltage …".
108	2nd and 3rd lines	Change "The angle-averaged reflectivity is reduced .." to "The range-averaged reflectivity was reduced ..". Change "The range-averaged reflectivity is reduced .." to "The angle-averaged reflectivity was reduced .." (Note two changes in each phrase.)
110	Eq. 2.123	Change $x(t'-t)$ to $x(t-t')$ in the integrand.

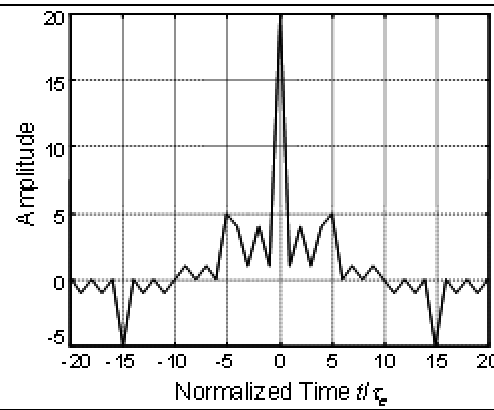
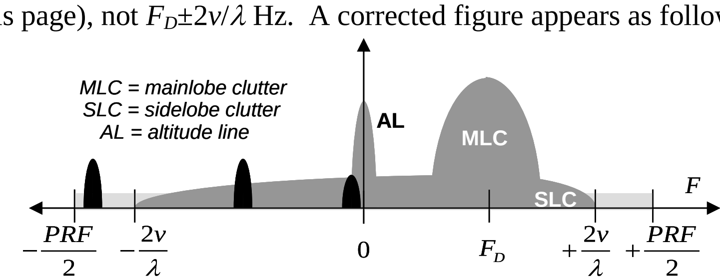
Page	Location on Page	Correction
110-111	Eqs. 2.124 – 2.126, Fig. 2.23 and 2.24	Poor typography. The symbol on the left-hand side of each eqn. is $\bar{Y}$. The Fourier transform of $\tilde{\rho}$ which appears in the right-hand side of each eqn. is $\tilde{\mathrm{P}}$ and should not be italicized in the eqns. Or in Figs. 2.23 and 2.24.
113	Sangston reference	Incorrect reference. Replace with Sangston, K. J., and K. R. Gerlach, "Coherent Detection of Radar Targets in a Non-Gaussian Background", IEEE *Transactions on Aerospace and Electronic Systems*, vol. AES-30, no. 2, pp. 330-340, April 1994.
117	Fig. 3.3	Change the label "Range Sample/" to "Range Sample *l*" on the datacube in the upper right of the figure.
122	Fig. 3.6	The Rayleigh bandwidth β_r is not shown on the figure as promised. The corrected figure is shown here: 
128	2nd paragraph	Change "No. #5" to "number 5" in the 7th and 8th lines.
132	Fig. 3.12	The Rayleigh bandwidth β_r is not shown on the figure as promised. The corrected figure is shown here: 
137	Eqs. 3.22 and 3.23	Change the units from cycle/m to cycles/m in both equations.

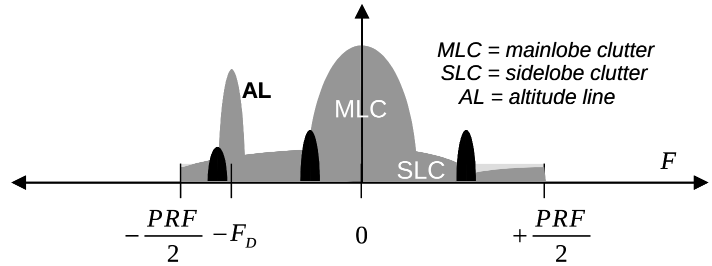
Page	Location on Page	Correction
141	Fig. 3-20	The *y*-axis labels in all three parts should be $\tilde{y}[n]$, not *y*[*n*]. the corrected figure is: 
143	Eq. 3.37	Rewrite to use a version of the error function compatible with the one used in Ch. 6. The equation now becomes $$\frac{\tilde{\sigma}^2}{\sigma^2} \cong K^2\left\{N^2 \operatorname{erf}\left[\left(N+\frac{1}{2}\right)K\Big/\sqrt{2}\right] - \sum_{i=0}^{N-1}(2i+1)\operatorname{erf}\left[\left(i+\frac{1}{2}\right)K\right]\Big/\sqrt{2}\right\}$$
143	Eq. 3.38	Rewrite to use a version of the error function compatible with the one used in Ch. 6. New equation is $$\operatorname{erf}(z) \equiv \frac{2}{\sqrt{\pi}}\int_0^z e^{-x^2}\,dx$$ **NOTE**: this correction supersedes a different correction (using the old form of erf(*x*)) in previous versions of this errata sheet!
145	Eq. 3.39	A factor two is missing on the summation. The corrected equation is $$\frac{\tilde{\sigma}^2}{\sigma^2} \approx K^2\left\{N^2 - 2\sum_{i=0}^{N-1}(2i+1)\operatorname{erf}\left[\left(i+\frac{1}{2}\right)K\right]\right\}$$
149	Eq. 3.49	Usage of braces, brackets and parentheses on right-hand side is erroneous. Corrected eqn. is as follows: $$\begin{bmatrix} I' \\ Q' \end{bmatrix} = \begin{bmatrix} A\cos\theta \\ A\sin\theta \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}\left\{\begin{bmatrix} I \\ Q \end{bmatrix} - \begin{bmatrix} \gamma \\ \kappa \end{bmatrix}\right\} = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}\begin{bmatrix} A\cos\theta \\ A(1+\varepsilon)\sin(\theta-\phi) \end{bmatrix}$$
149	Eq. 3.52	Usage of braces, brackets and parentheses on right-hand side is erroneous. Corrected eqn. is as follows: $$\begin{bmatrix} I' \\ Q' \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ \tan\phi & \dfrac{1}{(1+\varepsilon)\cos\phi} \end{bmatrix}\left\{\begin{bmatrix} I \\ Q \end{bmatrix} - \begin{bmatrix} \gamma \\ \kappa \end{bmatrix}\right\}$$
156	3rd line from bottom	Poor typography. Change $Y_1 * (\omega)$ to $Y_1^*(\omega)$. (The asterisk is indicating complex conjugate of Y_1).
156	3rd line from bottom	Change $Y_1 * (-\omega)$ to $Y_1^*(-\omega)$

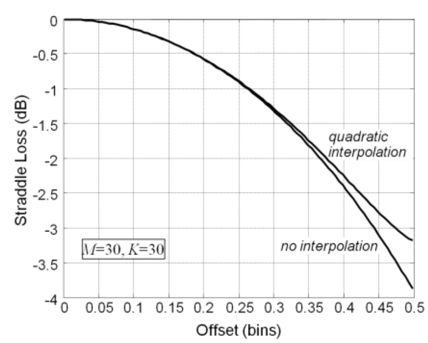
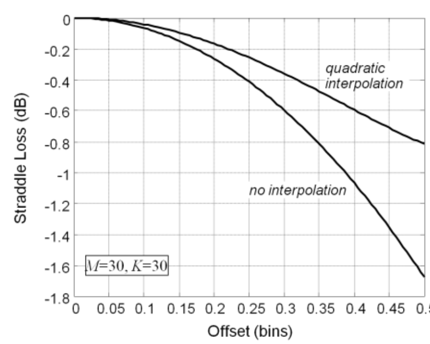
Page	***Location on Page***	***Correction***
164	Eq. 4.19	Multiple errors. Corrected equation is $y(t)=\begin{cases}\alpha\left(t-(T_M-\tau)\right), & T_M-\tau\le t\le T_M\\ \alpha\left((T_M+\tau)-t\right), & T_M\le t\le T_M+\tau\\ 0, & \text{otherwise}\end{cases}$
168	Eq. 4.28	Missing *j* in the exponential in the 3rd line. Corrected equation is (3rd line only shown) $=\dfrac{\alpha}{j(\Omega_D-\Omega_i)}\exp\left[j(\Omega_D-\Omega_i)s\right]\Big\vert_0^{\tau}$
169	6th text line from bottom	Change “Sec. 4.6.2” to “Sec. 4.6.4”.
172	Eq. 4.47	Missing the term $\exp(j2\pi F_D t)$ in the second line. The corrected equation is $\hat{A}(-t,-F_D)=\int_{-\infty}^{\infty}x(s'-t)\exp\left(-j2\pi F_D(s'-t)\right)x^*(s')\,ds'$ $=\exp(j2\pi F_D t)\int_{-\infty}^{\infty}x(s'-t)\exp(-j2\pi F_D s')x^*(s')\,ds'$ $=\exp(j2\pi F_D t)\hat{A}^*(t,F_D)$
173	Eq. 4.49	Closing brace is in incorrect location. Corrected eqn. is as follows: $\hat{A}(t,F_D)=\int_{-\frac{\tau}{2}+t}^{\frac{\tau}{2}}\frac{1}{\tau}\exp(j2\pi F_D s)\,ds$ $=\dfrac{\exp\left[j2\pi F_D\,\tau/2\right]-\exp\left[j2\pi F_D(-\tau/2+t)\right]}{\tau\,j2\pi F_D}$ $=\dfrac{1}{\tau\,j2\pi F_D}e^{j2\pi F_D t/2}\left\{\exp\left[j2\pi F_D\left(\frac{\tau}{2}-\frac{t}{2}\right)\right]\right.$ $\left.-\exp\left[-j2\pi F_D\left(\frac{\tau}{2}-\frac{t}{2}\right)\right]\right\}$
176	3rd line above Eq. 4.54	Change “As observed in Chap. 1, better frequency …” to “Better frequency …”.
179	2nd line after Eq. 4.61	Change “… $y_0(0)=s_P(0)$.” To “… $y_0(t_l)=s_P(0)$.”.
182	Eq. 4.70	Left-hand side is $Y[l,\omega;\omega_D)$, not $Y[l,w;w_D)$
183	12th line	Change “… $v_k=\lambda/2KT$ meter per second …” to “… $v_k=\lambda k/2KT$ meters per second …”. (Note change to both formula and the word “meters”.)
184	Eq. 4.78	Change $\hat{A}_p$ to A_p inside the summation.
185	Last line before Eq. 4.80	Change $\sin(\pi F_D\tau)/\pi F_D\tau$ to $\left\vert\sin(\pi F_D\tau)/\pi F_D\tau\right\vert$.
188	2nd line	Change “… sample-to sample …” to “… sample-to-sample …”.

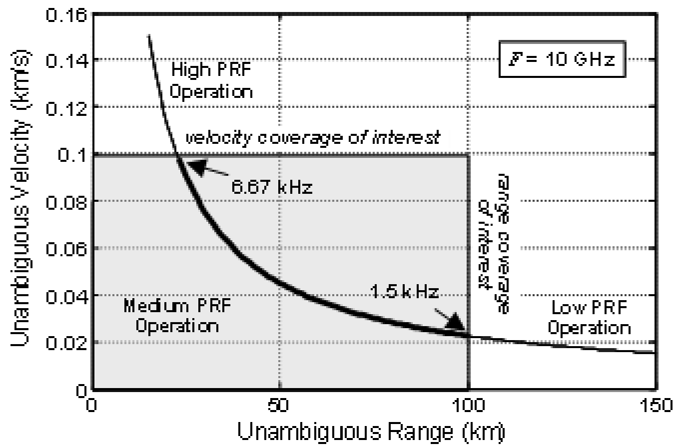
Page	***Location on Page***	***Correction***
189	Fig. 4.22	The waveform shown is the imaginary part of the chirp. The correct waveform for the real part is this one: 
192	Eq. 4.86	The factor of 2 under the square root belongs in the numerator, not the denominator. Also, change $x(t_0)$ to $A(t_0)$. The corrected equation is $$X(\Omega) \approx \sqrt{\frac{-2\pi}{\phi''(t_0,\Omega)}}\, e^{-j\frac{\pi}{4}}\, A(t_0)\, e^{j\phi(t_0,\Omega)}$$ (The factor of 2 error is also in the reference (Raney, 1992).)
193	Eq. 4.88	The last $d\Omega$ should be dt instead.
193	Eq. 4.89	Change Ω to Ωt in first line. Corrected equation is (1st line only) $\phi(t,\Omega) = \alpha t^2 - \Omega t$.
193	Eq. 4.91	The error in Eq. 4.86 requires a correction to 4.91 also: $$X(\Omega) \approx \sqrt{\frac{-2\pi}{\phi''(t_0,\Omega)}}\, e^{-j\frac{\pi}{4}}\, A(t_0)\, e^{j\phi(t_0,\Omega)}$$ $$= \sqrt{\frac{-2\pi}{2\alpha}}\, e^{-j\frac{\pi}{4}}\, A\left(\frac{\Omega}{2\alpha}\right) e^{j\left[\alpha\left(\frac{\Omega}{2\alpha}\right)^2 - \Omega\left(\frac{\Omega}{2\alpha}\right)\right]}$$ $$= j\sqrt{\frac{\pi}{\alpha}}\, e^{-j\frac{\pi}{4}}\, A\left(\frac{\Omega}{2\alpha}\right) e^{-j\left(\frac{\Omega^2}{4\alpha}\right)}$$
193	Eq. 4.93	The error in Eq. 4.86 requires a correction to 4.93 also: $$X(\Omega) \approx j\sqrt{\frac{\pi}{\alpha}}\, e^{-j\frac{\pi}{4}}\, e^{-j\left(\frac{\Omega^2}{4\alpha}\right)}, \quad -2\pi\left(\frac{\beta}{2}\right) \le \Omega \le +2\pi\left(\frac{\beta}{2}\right)$$
198	Eq. 4.105	The carrier term should also reflect the time delay from the scatterer: $$\bar{x}(t) = \zeta \exp\left(j\pi\frac{\beta}{\tau}(t-t_b)^2\right)\exp\left(j\Omega(t-t_b)\right), \quad t_b = t_0 + \Delta t_b, \quad 0 \le t - t_b \le \tau$$ (This correction results in the next several corrections as well, going through Eq. 4.113, and also Eq. 8.56 in Ch. 8).

Page	***Location on Page***	***Correction***
199	Fig. 4-30	The input to the receiver is $\bar{x}(t)$, not $x(t)$, and the reference oscillator carrier term is referenced to t_0: 
199	4th line of text	Change "… conventional term exp($-j\Omega t$) …" to "… conventional term exp($-j\Omega(t-t_0)$) …"
199	Eq. 4.106	Correct the argument of the first exponential and the limits on $y(t)$: $$y(t)=\zeta\exp\left[-j\left(\Omega+2\pi\frac{\beta}{\tau}(t-t_0)\right)\Delta t_b\right]\exp\left(j\pi\frac{\beta}{\tau}(\Delta t_b)^2\right),\, t_0+\Delta t_b\le t\le t_0+\Delta t_b+\tau$$
199	3rd line after Eq. 4.106	Change "…exponential is linear in t …" to "…exponential contains a term that is linear in t …"
199	Eq. 4.108	Correct the argument of the first exponential: $$y(t)=\sum_i\zeta_i\exp\left[-j\left(\Omega+2\pi\frac{\beta}{\tau}(t-t_0)\right)\Delta t_{b_i}\right]\exp\left(j\pi\frac{\beta}{\tau}\left(\Delta t_{b_i}\right)^2\right)$$
201	Eq. 4.112	The carrier term should also reflect the time delay from the scatterer, and the amplitude should be ζ instead of ζ_i: $$\bar{x}(t)=\zeta\exp\left(j\pi\frac{\beta}{\tau}(t-t_b)^2\right)\exp\left(j2\pi F_D t\right)\exp\left(j\Omega(t-t_b)\right),\quad 0\le t-t_b\le\tau$$
201	Eq. 4.113	Correct the exponential argument and regroup to make the result more obvious: $$y(t)=\varsigma\exp\left[-j\left(2\pi\left(\frac{\beta}{\tau}\Delta t_b-F_D\right)t-2\pi\frac{\beta}{\tau}\Delta t_b t_0+\Omega\Delta t_b\right)\right]\exp\left(j\pi\frac{\beta}{\tau}(\Delta t_b)^2\right)$$
201	1st line after Eq. 4.113	Change "… is to decrease the beat frequency …" to "… is to increase the beat frequency …"
201	Eq. 4.114	Change units from "Hz" to "m".
204	1st line after Eq. 4.117	Change "4 dB" to "5.6 dB".
205	Last line before Eq. 4.118	Change "(Prince, 1979)" to "(Price, 1979)".
210	2nd line before Eq. 4.128	Change δt to Δt.
210	Eq. 4.129	Change ΔR on the left-hand side only to δR. The corrected equation is $$\delta R=\frac{c}{2K\Delta F}=\frac{M}{K}\Delta R$$
211	4th line of text	Change "… K high-resolution range bins ($c/2\beta$ meters)." to "… M high-resolution range resolution cells ($c/2\beta$ meters) sampled at K points within the coarse range bin. If $K = M$ the range sample spacing equals the range resolution; if $K > M$ the range profile is oversampled compared to the resolution by the factor K/M."

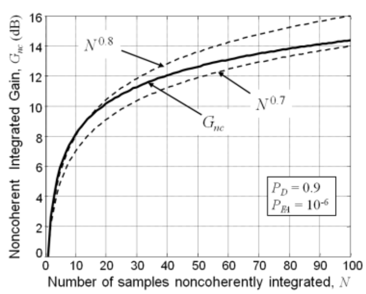
Page	Location on Page	Correction
213	Fig. 4.40	Change F/τ on horizontal axis label to $F\tau$ on both parts of the figure.
214	Fig. 4.41	Change F/τ_c on horizontal axis label to $F\tau_c$.
214	Table 4.1	The second code listed for $N = 3$, namely "+ – +", is not a valid Barker code and should be deleted.
215	2nd line	The Barker code should be expressed in +1/-1 notation rather than +1/0 notation to get the stated autocorrelation sequence and for consistency with the remainder of this section. Thus, change "… $\{A_n\} = \{1,1,1,1,1,0,0,1,1,0,1,0,1\}$ …" to "… $\{A_n\} = \{1,1,1,1,1,-1,-1,1,1,-1,1,-1,1\}$ …"
216	Eq. 4.133	The sequence shown in $B_5 \otimes B_5$, not $B_4 \otimes B_5$ as intended. The corrected equation is $$\begin{aligned} B_4 \otimes B_5 &= \{1\ 1\ 1\ \text{-}1\} \otimes \{1\ 1\ 1\ \text{-}1\ 1\} \\ &= (1)\{1\ 1\ 1\ \text{-}1\ 1\} + (1)\{1\ 1\ 1\ \text{-}1\ 1\} + (1)\{1\ 1\ 1\ \text{-}1\ 1\} + \ldots \\ &\qquad \ldots + (-1)\{1\ 1\ 1\ \text{-}1\ 1\} \\ &= \{1\ 1\ 1\ \text{-}1\ 1\ 1\ 1\ 1\ \text{-}1\ 1\ 1\ 1\ 1\ \text{-}1\ 1\ \text{-}1\ \text{-}1\ \text{-}1\ \text{+}1\ \text{-}1\} \end{aligned}$$
217	Fig. 4.44	The sequence shown is not the correct autocorrelation of the corrected sequence in Eq. 4.133. The corrected figure is shown here: 
217	Paragraph after Fig. 4.44	Change the sentence "The peak side lobe for MPS codes of length $N \le 28$ is 2, for $29 \le N \le 48$ and $N = 51$ it is 3, and for $N = 50$ and $51 \le N \le 69$ it is 4." To "The peak side lobe for MPS codes of length 2 – 5, 7, 11, and 13 (Barker codes) is 1; for N = 6, 8-10, 12, 14-21, 25, and 28 it is 2; for N = 22-24, 26-27, 29-48, and 51 it is 3; and for N = 49-50 and 52-70 it is 4."
226	Fig. 5.1	The label on the horizontal axis (abscissa) should be F instead of F_D.
226	End of 1st paragraph	Change "… Eaves and Reddy (1988), …" to "… Eaves and Reedy (1987), …" (note two corrections).
227	Fig. 5.2	The depiction of sidelobe clutter extent in the figure is incorrect. SLC extends over $\pm 2v/\lambda$ Hz (consistent with velocity ranges from $-v$ to $+v$ m/s as described in the 4th line of text on this page), not $F_D \pm 2v/\lambda$ Hz. A corrected figure appears as follows: 

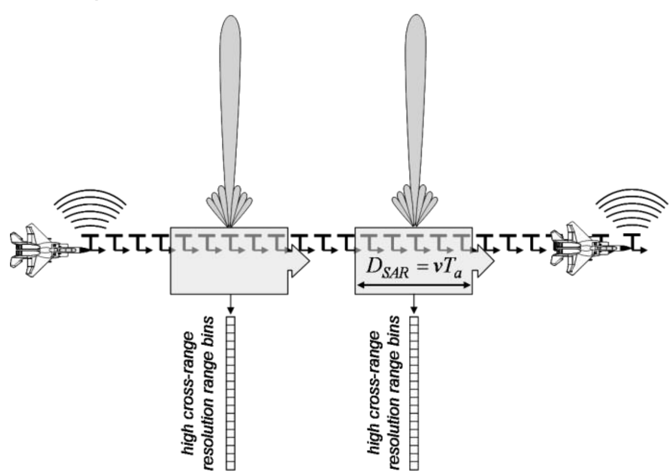
Page	**Location on Page**	**Correction**
227-228	Fig. 5.3	This figure should also be replaced to correct the abscissa labeling and maintain an appearance consistent with Fig. 5.2. The corrected figure appears as follows:  In addition, the following changes should be made to the paragraph beginning at the bottom of p. 227 and continuing to page 228: • 1st sentence: change "… on the generic spectrum …" to "… on the spectrum of Fig. 5.2 …". • 2nd sentence: change "(This figure assumes that the data …" to "(This figure assumes the PRF has been reduced to 60% of the PRF in Fig. 5.2 and that the data …" • 4th sentence: change "… over most of the Doppler spectrum/" to "… over virtually all of the Doppler spectrum." • 5th and 6th sentences: replace these with "Furthermore, all three targets now compete with substantial clutter returns."
233	Eq. 5.4	Missing the term (-1)^m in the intermediate result. The corrected equation is $h_N[m] = (-1)^m \binom{N-1}{m} = (-1)^m \dfrac{(N-1)!}{m!(N-1-m)!}, \quad m = 0, \ldots, N-1$
234	text following Eq. 5.8	change "with equality if and only if …" to "where $\lVert\mathbf{p}\rVert \equiv \sqrt{\mathbf{p}^H\mathbf{p}}$ and equality occurs if and only if …"
242	Sentence preceding Eq. 5.38	Missing a "*j*" in the expression for $y(t)$. Change to "Consider the analog input $y(t) = A\exp[j(2\pi F_0 t + \phi_0)]$ for some …"
242	Eq. 5.38	Change index from *n* to *m*. Not really an error, but more consistent with equations to follow. Corrected equation is $t_m = t_0 + \sum_{p=0}^{m-1} T_{((p))_P}, \quad m = 0, \ldots, \infty$
242	last sentence	Change "… sequence $x[m]$ by sampling $x(t)$ …" to "… sequence $y[m]$ by sampling $y(t)$ …"
243	Eq. 5.41	Change $\lvert y[m]\rvert^2$ to $\lvert z[m]\rvert^2$. Corrected equation is $\lvert H_{2,P}(F_0)\rvert^2 = \dfrac{\frac{1}{P}\sum_{m=0}^{P-1}\lvert z[m]\rvert^2}{\lvert x[m]\rvert^2} = \dfrac{4A^2\sum_{m=0}^{P-1}\sin^2(\pi F_0 T_m)}{PA^2}$
244	1st paragraph, 5th line from bottom	Change "… reduced by a factor of 45/47, or 8 percent." To "… reduced by a factor of 36/47, or about 23 percent."

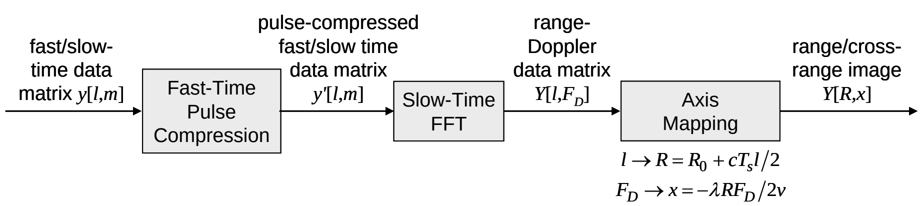
Page	***Location on Page***	***Correction***
247	3rd line before Eq. 5.53	Change “$S_c(\omega) = k\exp\left(-\omega^2/\sigma_\omega^2\right)$” to “$S_c(\omega) = A\exp\left(-\omega^2/\sigma_\omega^2\right)$”. ($k$ is used for the autocorrelation lag variable and should not also be used as an amplitude scale factor.)
252	Eq. 5.74	Change the limits on m in all three summations to 0 to M-1 instead of 1 to M. The corrected equation is $\lvert Z\rvert^2 = \lvert A\rvert^2\left(\sum_{m=0}^{M-1}\lvert a_m\rvert^2 + e^{-\sigma_\phi^2}\sum_{\substack{m=0\\ m\neq k}}^{M-1}\sum_{k=0}^{M-1} a_m a_k^*\right)$.
252	last line of 2nd-to-last paragraph	Change “… Skolnik (1998), …” to “Skolnik (1990), …”.
257	4th line after Eq. 5.80	Change “highest for small M” to “higher for small M”.
258	last sentence of footnote	Change “… book by Harris …” to “… paper by Harris …”
261	last line before Eq. (5.89)	Change “… vector **x** the output **h′x** of …” to “… vector **y** the output **h′y** of …”
266	Eq. 5.104	This equation is identical to 5.102, rather than being the result of substituting 5.103 into 5.102. The result of doing that is not particularly simple, so I’ll probably just delete 5.104 in a future edition.
269	6th line	Change “… estimation errors …” to “… estimation error …”.
270	Fig. 5.22	The graphs shown are not those described in the text. The correct figures are these:  Fig. 5.22(a)  Fig. 5.22(b)
270	1st test line	Change “0.2 dB” to “0.17 dB”.
271	Fig. 5.23 caption	Change “… clutter suppression filter frequency response, …” to “… clutter suppression filter, …”.
275	Eq. 5.116	Incorrect exponents. The equation should read $s_{y'}[1] = \lvert A\rvert^2 e^{-2\pi^2\sigma_F^2T^2} = s_y'[0]e^{-2\pi^2\sigma_F^2T^2}$.
276	Eq. 5.120	Missing equals sign between the two integrals. Corrected equation is $\hat{P}_y = \frac{1}{2\pi}\int_{-\pi}^{+\pi} S_y(\omega)\,d\omega = \frac{1}{2\pi}\int_{-\pi}^{+\pi}\lvert Y(\omega)\rvert^2\,d\omega$

Page	Location on Page	Correction
281	Fig. 5.28	The axis labels on the figure should be unambiguous velocity and unambiguous range, and the edges of the shaded area should refer to velocity coverage and range coverage. The difference is that the maximum positive velocity, corresponding to a Doppler shift of $F_D/2$ Hz, would be half of the unambiguous velocity shown (which corresponds to a Doppler range of F_D Hz). The relabeled figure is as follows: 
282	4th line above Eq. 5.136	Change "that is, β_0 satisfies $\beta_0 \cdot 12 \cdot 13 = 156\beta_0 = 11k+1$ for some integer k." to "that is, β_0 satisfies $\beta_0 = 11k+1$ for some integer k."
282	Eq. 5.136	The modulus is $N_0N_1N_2$, not $N_1N_2N_3$. The corrected equation is $$\hat{n}_t = \left(\left(\alpha_0 n_{a_0} + \alpha_1 n_{a_1} + \alpha_2 n_{a_2}\right)\right)_{N_0N_1N_2} = 19$$
287	Fig. 5.36	Add a new sentence at the end of the caption: "The change in Doppler center frequency has been removed."
287	1st paragraph of 5.7.1	Change "… spreading of the main lobe clutter by the platform motion." to "… spreading of the main lobe clutter by the platform motion (the change in Doppler center frequency has been removed)."
288-289	multiple occurrences in text, plus Fig. 5.37 and Eq. 5.138	Change the symbol Δx to d_{pc} throughout for consistency with section 5.7.2 analysis. There are 6 occurrences in the text on p. 288, plus two in Fig. 5.37. There are 3 occurrences in the text on p. 289, plus one in Eq. 5.138.
289	Eq. 5.138	Change the equation to $M_s = \dfrac{d_{pc}}{vT}$. (This assumes that Δx has been replaced with d_{pc} per preceding erratum.)
292	1st line	Change "Using Eq. (5.143), …" to "Using Eq. (5.143) and allowing for two-way propagation, …"
292	Eq. 5.144	Incorrect exponents. The corrected equation is: $$\gamma_f = \exp\left[j\left(\frac{4\pi}{\lambda_k}R + \theta_f\right)\right]$$ $$\gamma_a = \exp\left[j\left(\frac{4\pi}{\lambda_k}R + \theta_a + \Delta\phi\right)\right]$$

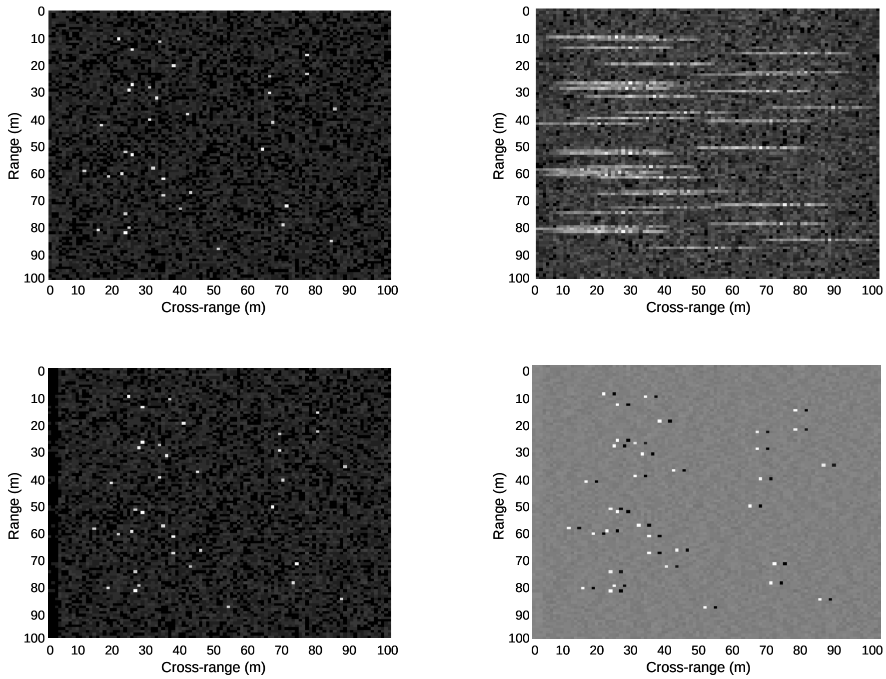
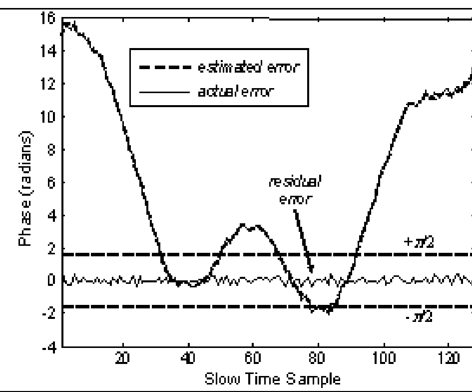
Page	***Location on Page***	***Correction***
293	Eqs. 5.149	Replace the symbol k' with the symbol α to avoid confusion over multiple uses of k: $$z[l,k]=\alpha\left\{\beta[k]\left(1+\frac{\sigma_n^2}{\sigma_c^2}\right)\mathbf{Y}_f[l,k]-\rho^*[k]e^{+j2\pi M_s k/K}\mathbf{Y}_a[l,k]\right\}$$
293	Eqs. 5.150	Replace the symbol k' with the symbol α to avoid confusion over multiple uses of k: $$z[l,k]=\alpha\left\{\beta[k]\mathbf{Y}_f[l,k]-e^{+j2\pi M_s k/K}\mathbf{Y}_a[l,k]\right\}$$
293	Eaves & Reedy reference	Change date from 1988 to 1987.
297	Eq. 6.1	Inconsistent use of symbol for matrix transpose. Should be $\mathbf{y}\equiv\left[y_0 \quad \dots \quad y_{N-1}\right]'$
299	Last paragraph, 1st line	Change "The LRT test is …" to "The LRT is …".
301	Eq. 6.13	Change lower limit on summation from $n - 0$ to $n = 0$.
309	Last paragraph, 1st line	Change "The LRT test is …" to "The LRT is …".
309	2nd line prior to Eq. 6.30	Font error. Change "… with $\mathbf{m} = \mathbf{0_N}$ under hypothesis H_0 and $\mathbf{m} \neq \mathbf{0_N}$ under hypothesis H_1." To "… with $\mathbf{m} = \mathbf{0}_N$ under hypothesis H_0 and $\mathbf{m} \neq \mathbf{0}_N$ under hypothesis H_1."
310	Paragraph before Eq. 6.31, 6th line	Change "… complex number of the form $m_n e^{j\theta_n}$." To "… complex number m_n."
310	2nd-to-last line	Delete the entire sentence "Note that if $\mathbf{m} = m\mathbf{1}_N$, … to Eq. (6.13) again."
311	2nd line after Eq. 6.33	Change "$H_1\mathbf{y} = \mathbf{m} + \mathbf{w}$ and …" to "H_1, $\mathbf{y} = \mathbf{m} + \mathbf{w}$ and …"
311	2nd paragraph	Change "… used in Example 7.2, …" to "… used in Section 6.1.2, …"
314	Eq. 6.39	The phase angle of the term $\tilde{\mathbf{m}}^H\mathbf{y}$ was neglected; there is also a sign error on the phase angle θ. The corrected equation and a new line of text after it should read as follows: $$\begin{aligned}p_{\mathbf{y}}\left(\mathbf{y}\middle|H_1,\theta\right)&=\frac{1}{\pi^N\beta^{2N}}\exp\left[-\frac{1}{\beta^2}\left(\mathbf{y}^H\mathbf{y}-2\operatorname{Re}\left\{\tilde{\mathbf{m}}^H\mathbf{y}e^{-j\theta}\right\}+E\right)\right]\\&=\frac{1}{\pi^N\beta^{2N}}\exp\left[-\frac{1}{\beta^2}\left(\mathbf{y}^H\mathbf{y}-2\left|\tilde{\mathbf{m}}^H\mathbf{y}\right|\cos(\phi-\theta)+E\right)\right]\end{aligned}$$ where ϕ is the unknown, but fixed, phase of the inner product $\tilde{\mathbf{m}}^H\mathbf{y}$.
314	Eq. 6.40 and preceding sentence	Continuing the same correction, the modified sentence and equation are: Assuming a uniform random phase θ, defining $\theta' = \phi - \theta$, and applying Eq. (6.37) under H_1 gives, after minor rearrangement, $$p_{\mathbf{y}}\left(\mathbf{y}\middle|H_1\right)=\frac{1}{\pi^N\beta^{2N}}e^{-\frac{1}{\beta^2}\left(\mathbf{y}^H\mathbf{y}+E\right)}\frac{1}{2\pi}\int_0^{2\pi}\exp\left[\frac{2}{\beta^2}\left|\tilde{\mathbf{m}}^H\mathbf{y}\right|\cos\theta'\right]d\theta'$$

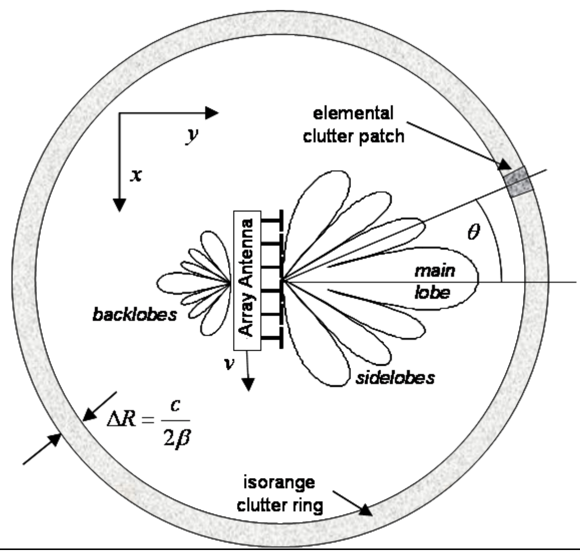
Page	Location on Page	Correction
325	Eqs. 6.66 – 6.68	The term $\exp\left(-\tilde{m}^2/\beta^2\right)$ becomes $\exp\left(-N\tilde{m}^2/\beta^2\right)$ when it is pulled out of the product in Eq. (6.66); this correction propagates to Eqs. (6.67) and (6.68). The corrected equations are $(6.66):\quad \Lambda = \prod_{n=0}^{N-1} e^{-\tilde{m}^2/\beta^2} I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right) = e^{-N\tilde{m}^2/\beta^2} \prod_{n=0}^{N-1} I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right) \underset{H_0}{\overset{H_1}{\gtrless}} -\lambda$ $(6.67):\quad \ln\Lambda = -\frac{N\tilde{m}^2}{\beta^2} + \sum_{n=0}^{N-1} \ln\left[I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right)\right] \underset{H_0}{\overset{H_1}{\gtrless}} \ln(-\lambda)$ $(6.68):\quad \sum_{n=0}^{N-1} \ln\left[I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right)\right] \underset{H_0}{\overset{H_1}{\gtrless}} \ln(-\lambda) + \frac{N\tilde{m}^2}{\beta^2} \equiv T$
326	3rd line of 2nd paragraph	z should not be squared in this expression. The corrected sentence is "… and thus replacing z with $z' = \sum (z_n')^2 = z/\beta^2$; such a scaling …"
328	Eq. 6.85	Need z' instead of z in exponent on right-hand side. Corrected equation is $p_{z'}\left(z' \mid H_1\right) = \left(\frac{z'}{N\chi}\right)^{\frac{N-1}{2}} e^{-z'-N\chi} I_{N-1}\left(2\sqrt{N\chi z'}\right)$
331	Second paragraph	In 1st sentence, change "… as a function of *N*." to "… as a function of *N* for the case where $P_D = 0.9$ and $P_{FA} = 10^{-6}$."
332	Fig. 6.11	P_D and P_{FA} parameters need to be specified in this figure. Replace with this version: 
335	Last sentence prior to Table 6.1	Change "… requires $\chi \approx 6$ dB for the nonfluctuating case, but $\chi \approx 17$ dB for the Swerling 5 case, …" to "… requires $\chi \approx 6.5$ dB for the nonfluctuating case, but $\chi \approx 17.5$ dB for the Swerling 1 case, …"
337	Eq. 6.111	Typographical error. The last line of the equation should read: $C = 10^{C_{dB}/10}$ (*i.e.*, the exponent is the quantity $C_{dB}/10$).
339	Sentence prior to Eq. 6.116	Change *H* (symbol for number of successful trials) to *M*
340	1st line	Change *H* to *M*.

Page	Location on Page	Correction
354	Eq. 7.14	The form given is for positive $\hat{T}$ only; it should be zero for negative $\hat{T}$. The corrected equation is $$p_{\hat{T}}\left(\hat{T}\right)=\begin{cases}\left(\dfrac{N}{\alpha\beta^2}\right)^N\dfrac{\hat{T}^{N-1}}{(N-1)!}e^{-N\hat{T}/\alpha\beta^2}, & \hat{T}\ge 0\\ 0, & \hat{T}<0\end{cases}$$
354	Eq. 7.15	With the correction to Eq. 7.14 this is correct as is, however, it would be better to change the lower limit on the integral to zero.
354	Eq. 7.18	With the correction to Eq. 7.14 this is correct as is, however, it would be better to change the lower limit on the integral to zero.
356	Sentence after Eq. 7.23	Change "… for the Swerling 1, N = 1 case with a known interference power." To "… for the Swerling 1 case with no noncoherent integration and a known interference power." (This is to avoid having two different meanings for N at the same time; we are using N for the number of reference cells here.)
371	Eq. 7.44	Change subscript $y_{(k)}$ to y_i in three places. Corrected equations are: $$p_{y_i}(y)=e^{-y}$$ $$P_{y_i}(y)=\int_0^y p_{y_i}(y')\,dy'=1-e^{-y}$$
389, 397, 400	See adjacent block	Change "SAR radar" to "SAR" or "SAR radars" to "SARs" in the following places: p. 389, 2nd paragraph, 7th line; p. 397, 2nd paragraph, 3rd line; and p. 400, ;last paragraph, 3rd line.
389	Last paragraph, 5th line	Change :Soumkeh" to "Soumekh".
396	2nd paragraph	4th line: change "right" to "left"; 6th line, change "left" to "right".
394	Fig. 8.7	The two boxes with right-facing arrows should be a light translucent gray, not dark opaque gray, and the label $D_{SAR} = vT_a$ should be visible instead of obscured by the dark color. The corrected figure is shown here: 

Page	Location on Page	Correction
395	Eq. 8.7	The second line of this equation has an erroneous exponent, while the third line is correct except for an amplitude scale factor. The corrected equation is as follows: $$\begin{aligned} y(t) &= \sum_{n=-M}^{+M} y_n(t) = \sum_{n=-M}^{+M} \exp\left[j\Omega\left(t - \frac{2}{c}(R - nd\sin\theta) \right) \right] \\ &= e^{j\Omega t} e^{-j4\pi R/\lambda} \sum_{n=-M}^{+M} \exp\left[j2\Omega nd \sin\theta / c \right] \\ &= e^{j\Omega t} e^{-j4\pi R/\lambda} \left\{ \frac{\sin\left[(2M+1)\Omega d \sin\theta / c \right]}{\sin(\Omega d \sin\theta / c)} \right\} \end{aligned}$$
399 – 401	Section 8.1.3	This section needs to be made a little more precise. Eq. 8.13 is an approximation (albeit a good one); the corrected equation is $\Delta\theta \approx \frac{\Delta CR}{R}$. In Fig. 8.13 and surrounding text, $R_P = R$, so there is no reason to distinguish them. Then $x_P = R\sin\theta_P$. and $F_{DP} = (2v/\lambda)\sin\theta_P$. Thus, Eq. 8.16 becomes $x_P = R\sin\theta_P = \frac{\lambda R F_{DP}}{2v}$.
403	2nd line after Eq. 8.23	Change "… the stripmap "SAR *swath constraint* …" to "… the stripmap SAR *swath constraint* …" (*i.e.*, remove extraneous quotation mark).
405	Last line before Eq. 8.26	There is a sign error in the last term given for the square root expansion. The correct expansion is $\sqrt{1+x} = 1 + \frac{1}{2}x - \frac{1}{8}x^2 + \ldots$
413	Fig. 8.19	The pulse-compressed fast/slow time data matrix should be denoted $y'[l,m]$ instead of $y'[l,m]$. Also, Change F to F_D in the transformations under the last block in the diagram. The corrected figure is 
415	Fig. 8.21 caption	Change "(*a*) Rescaling of cross-range for range variation. (*b*) Shifting of range for cross-range displacement." to "(*a*) Rescaling of cross-range for cross-range displacement. (*b*) Shifting of range for range variation."
416	1st line of 3rd paragraph	Change "The assumption that the u^2/R term …" to "The assumption that the $u^2/2R$ term …".
416	Eq. 8.40	The denominator should have an "8" instead of a "4": $\frac{4\pi}{\lambda}\frac{v^2 T_a^2}{8R} \le \frac{\pi}{2}$
422	2nd-to-last text line	Change ΔR to δR.
422	Eq. 8.44	Change the "=" sign in the last line only to approximately equal sign "≈".

Page	***Location on Page***	***Correction***
423	Eq. 8.49	Sign error in the exponential. Also, don't change Ω to $4\pi/\lambda$ in the exponential; this obscures the dependence on Ω. Finally, change argument t on left-hand side to Ω. The corrected equation is $\mathscr{H}\left(K_u,\Omega;R_0\right)=\int_{-\infty}^{+\infty}\exp\left\{-j\left[K_u u+\Omega\left(\delta R+\sqrt{(u-x)^2+R_0^2}\right)\right]\right\}du$
428	2nd line before Eq. 8.55	Change "… $\delta R_i = c\delta t_i$ …" to "… $\delta R_i = c\delta t_i/2$ …".
428	2nd line after Eq. 8.55	Change "… $R_0+\delta t_i$ …" to "… $R_0+\delta R_i$ …"
428	Eq. 8.56	Correct the argument of the exponential (this ripples down from the corrections to Eq. 4.108): $y(t)=w(t)\int_{-\infty}^{+\infty}\tilde{\rho}(\delta t)\exp\left[-j\left(\Omega_0+2\pi\frac{\beta}{\tau}(t-t_0)\right)\delta t\right]\exp\left(j\pi\frac{\beta}{\tau}(\delta t)^2\right)d(\delta t)$
429	Eq. 8.59 and 8.60	This is just poorly expressed. The first line of Eq. 8.59 is correct. The 2nd and 3rd lines, however, are expressing the range of Ω or F over which the argument of $\tilde{\mathrm{P}}$ varies as t varies over the region of support of $w(t)$. This same problem exists in Eq. 8.60. This will have to be expressed more carefully in a future edition.
447	Table 8.2 caption	Source credit is missing. Should read: "Motion Compensation Error Budget (Source: Kennedy, 1988b)"
448	Eq. 8.88	The term $\left(1+\frac{1}{(M-1)^2}\right)$ should be changed to $\left(1-\frac{1}{(M-1)^2}\right)$
449	Eq. 8.89	The term $\left(1+\frac{1}{(M-1)^2}\right)^{-1}$ should be changed to $\left(1-\frac{1}{(M-1)^2}\right)^{-1}$
449	2nd to last line	Change "$m = m_0$" to "$k = k_0$"
453	Last paragraph	Change "The estimated phase error, and the difference …" to "The estimated phase error, corrected for the 3 pixel offset, and the difference …"

Page	***Location on Page***	***Correction***
454-455	Fig. 8.45	The 4 parts of this figure are all qualitatively correct, but are actually from different example cases. In a future printing, they will be replaced with the following set that come from the same case: 
456	Fig. 8.46	This figure is also qualitatively correct but will be updated for consistency with the example of Fig. 8.45: 
459	Schleher reference	The reference should be to "Schleher, D. C., …" instead of "Schleher, C. C., …"
461	Ch. 9	Notational problem: K_θ, first defined at top of p. 463, should be changed to k_θ throughout this chapter because it is a normalized spatial frequency. Specifically, define $k_\theta = K_\theta\, d$, with $K_\theta \equiv 2\pi \sin\theta/\lambda$. The units of k_θ are radians (or radians per element, or radians per phase center). Thus also replace F_θ with f_θ in cycles (per element or per phase center).
463	1st line	Change "… spatial frequency in cycles …" to "… spatial frequency in radians as projected into the plane of the array face …"
463	4th line	Change "… range of K_θ is $\pm\pi d/\lambda$;" to "… range of K_θ is $\pm 2\pi d/\lambda$;".

Page	***Location on Page***	***Correction***
463	Eq. 9.5	Need to conjugate and transpose the steering vector in the second and third lines of the equation. The corrected equation is $$\begin{aligned}\mathbf{h} &= \left[w_0 \quad w_1 e^{+jK_\theta} \quad \cdots \quad w_{N-1} e^{+j(N-1)K_\theta} \right]' \\ &= \left[w_0 \quad w_1 \quad \cdots \quad w_{N-1} \right]' \odot \mathbf{a}_s^H(\theta) \\ &= \mathbf{w}' \odot \mathbf{a}_s^H(\theta)\end{aligned}$$
464	Sentence prior to Eq. 9.10	Change "… $\kappa = 1/\sigma^2$ …" to "… $\kappa = \sigma^2$ …".
466	Eq. 9.12	σ_J should not be squared. Correct equation is $J_n(t) = \sigma_J w(t) e^{j[\Omega(t-nd\sin\theta/c)+\phi_0]}$
466	4th line from bottom	Change "In the left half of the figure, …" to "In the top half of the figure, …"
467	2nd line of text	Change "In the right half of the figure, …" to "In the bottom half of the figure, …"
472	Fig. 9.8	The antenna pattern is difficult to see due to use of too light of a line. The corrected figure is shown here: 
473	1st line after Eq. 9.25	Change "PRF" to "PRI".

Page	***Location on Page***	***Correction***
475	Eq. 9.27	The middle index of the middle entry in the vector should be "1" instead of "0". The corrected equation is $\mathbf{y} = \begin{bmatrix} y[l_0,0,0] \\ y[l_0,0,1] \\ \vdots \\ y[l_0,0,N-1] \\ y[l_0,1,0] \\ y[l_0,1,1] \\ \vdots \\ y[l_0,1,N-1] \\ \vdots \\ y[l_0,M-1,0] \\ y[l_0,M-1,1] \\ \vdots \\ y[l_0,M-1,N-1] \end{bmatrix}$
479	3rd line after Eq. 9.42	Change α to λ as the parameter that is a function of both wind and radar frequency.
480	Last sentence of Section 9.4.1	The expression in Eq. 9.45 is a Kronecker, not Hadamard, product. The last sentence should read "… a space-time window vector that is the Kronecker product …"
481	Eq. (9.46)	Change χ_c to χ_t. The corrected equation is $\chi_0 = MN\chi_c$.
484	Eq. 9.53	Because of the earlier change to Eq. 5.138 and the notation change on pp. 288-289, change this equation to $M_s = \dfrac{d_{pc}}{vT} \quad \Rightarrow \quad \beta = \dfrac{vT}{d_{pc}} = \dfrac{1}{M_s}$.
486	Eq. 9.54	Sign error in the time slip. Change the equation to $z[m] = y_f[m] - y_a[m+M_s]$
486	Eq. 9.55	Change the equation to $\mathbf{h}_1 \Rightarrow h_1[m,n] = \delta[m,n] - \delta[m+M_s, n+1]$
486	Eq. 9.56	The argument of the exponential in the summation is incorrect, and the two preceding errata also affect this equation. The corrected equation is $\begin{aligned} H_1(\omega_D,\tilde{K}_\theta) &= \sum_{m=0}^{M_s-1}\sum_{n=0}^{1} h_1[m,n]e^{-j(m\omega_D+n\tilde{K}_\theta)} \\ &= 1-\exp\left[-j\left(-M_s\omega_D-\tilde{K}_\theta\right)\right] \\ &= 1-\exp\left[j\left(M_s\omega_D+\tilde{K}_\theta\right)\right] \\ &= 1-\exp\left[j\left(M_s\omega_D-K_\theta\right)\right] \end{aligned}$ (Note: if notational suggestion for Ch. 9 (see entry above for p. 461) is adopted, then K_θ and $\tilde{K}_\theta$ in this equation would become k_θ and $\tilde{k}_\theta$.)
492 – 494	Eq. 9.68 and subsequent	The last line of Eq. (9.68) should read $z = \mathbf{h}'\mathbf{y}$ instead of $z = \mathbf{h}'\mathbf{t}$. This same correction is needed in step 6 at the top of p. 493, and in step 6 at the bottom of p. 494.

Page	***Location on Page***	***Correction***
503	Robey reference	The paper referenced as "Robey et al., 1992" on p. 490 is missing from the references. The reference is as follows: Robey, F. C., et al., "A CFAR Adaptive matched Filter Detector", *IEEE Transactions on Aerospace & Electronic Systems*, vol. AES-28(1), pp. 208-216, Jan. 1992.
511	Index entry for Signal-to-noise ratio	Change "305-208" to "305-308"

Errata for 1st & 2nd Printing

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