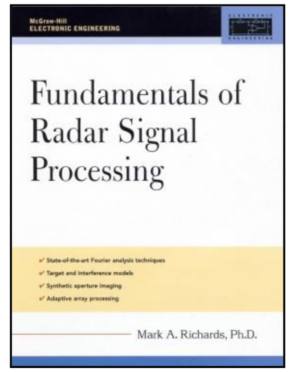
Errata for 3rd Printing Only



Fundamentals of Radar Signal Processing

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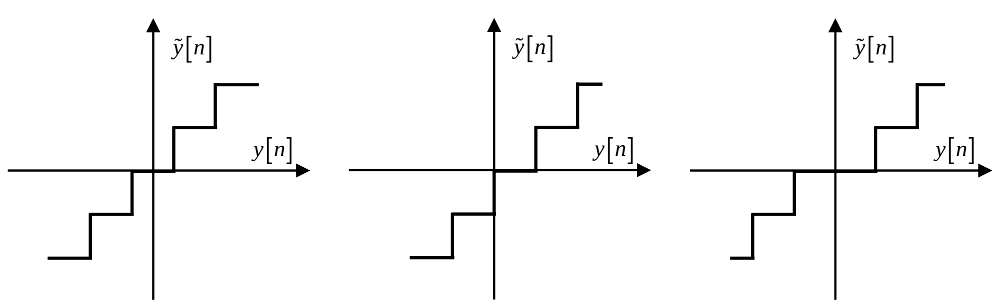
McGraw-Hill, New York, 2005

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*
xxiii	last line	Change "… staggered set of PRFs" to "… staggered PRFs"
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"
14	1st paragraph, last line	Change "… $z \neq 0$, …" to "… $x \neq 0$, …"
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 $n \in (-\infty,\infty)$
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."

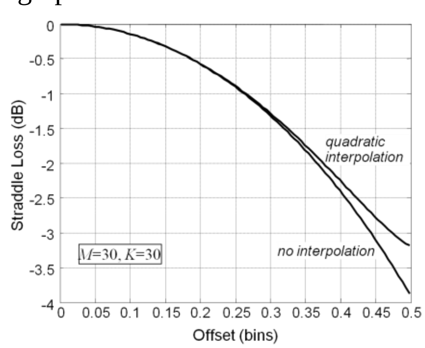
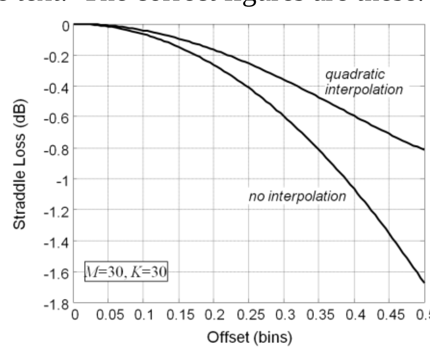
Page	***Location on Page***	***Correction***
53	1st paragraph, 12th line	Change "… such as detecting aircraft …" to "… such as detecting when aircraft …"
60	Eq. 2.24	$\sin\phi$ term missing from the differential in the integrand. The corrected equation is $\iint P^2(\theta,\phi)\sin\phi\, d\theta\, d\phi \cong \dfrac{\pi\theta_3\phi_3}{8\ln 2}G^2 = 0.57\theta_3\phi_3 G^2$
63	Eq. 2.31	Delete $d\phi$ from the second and third forms. The corrected equation is $dA = R_0 d\theta \cdot \dfrac{\Delta R}{\cos\delta} = \dfrac{R_0 \Delta R}{\cos\delta} d\theta$
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".
76	Table 2.4, entry for Chi-square of degree 4	The expression for the mean of $\bar{\varsigma}$ 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 $s_{\bar{y}}(\Delta z) = \int_{-\pi/\alpha}^{\pi/\alpha} \bar{y}(t;z)\bar{y}^*(t;z+\Delta z)\,dz = \int_{-\pi/\alpha}^{\pi/\alpha} \left\{ A e^{j\Omega(t-2R_0/c)} \sum_{n=-M}^{M} e^{-j\alpha z n} \right\} \cdot \left\{ A^* e^{-j\Omega(t-2R_0/c)} \sum_{l=-M}^{M} e^{+j\alpha(z+\Delta z)l} \right\} dz$
81	2nd-to-last line	Change "…(chi-square pdf, …" to "…(4th-degree chi-square pdf, …"

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 $SCR = \dfrac{\sigma \cos\delta}{R\sigma^0 \Delta R \theta_3}$ (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	Last paragraph	The 2nd sentence of last paragraph should read "… by the power transfer function $\lvert H(F)\rvert^2$ is used."
93	Eq. 2.85 and the sentence preceding	Change the sentence and equation to read as follows: "This is simply $$F_D \equiv F_r - F_t = +\frac{2v}{c}F_t = +\frac{2v}{\lambda_t}$$
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."
100	last line before Eq. 2.106	Remove the period at the end of this line.
101	Eqs. 2.108 and 2.109	Change the $\exp\left(j\frac{4\pi}{\lambda_t}R\right)$ to $\exp\left(-j\frac{4\pi}{\lambda_t}R\right)$ in both equations.
103	3rd line	Change "Chap. 7" to "Chap. 8".
103	Eq. 2.115	2nd line of equation is repeated on first line as well. The corrected equation is $$\hat{\rho}(\theta,\phi;R_0) = \int_R x\left(\frac{2}{c}(R_0 - R)\right)\rho'(R,\theta,\phi)\,dR = \left[\rho'(R,\theta,\phi) *_R x\left(\frac{2R}{c}\right)\right]_{R=R_0}$$

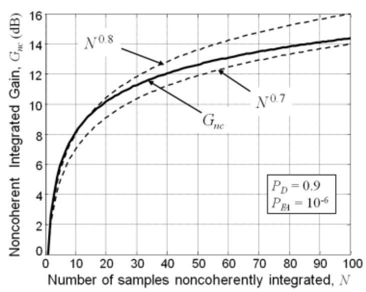
Page	***Location on Page***	***Correction***
104	Eq. 2.117	Limits over ς and ξ variables are reversed in the double integral. Corrected equation is $y(\theta,\phi;R_0)=A_r\int_{\xi=-\pi}^{\pi}\int_{\varsigma=-\frac{\pi}{2}}^{\frac{\pi}{2}} P(\varsigma-\theta,\xi-\phi)\hat{\rho}(\zeta,\xi;R_0)\,d\varsigma\,d\xi$ $=\hat{\rho}(\theta,\phi;R_0)*_\theta *_\phi P(\theta,\phi)$
104	Last line before Eq. 2.118	Change "$X = R\xi$" to "$X = R_0\xi$" and change "$Y = R\zeta$" to "$Y = R_0\zeta$".
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.
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.
128	2nd paragraph	Change "No. #5" to "number 5" in the 7th and 8th lines.
137	Eqs. 3.22 and 3.23	Change the units from cycle/m to cycles/m in both equations.
141	Fig. 3-20	The *y*-axis labels in all three parts should be $\tilde{y}[n]$, not $y[n]$. The corrected figure is: 
156	3rd line from bottom	Poor typography. Change $Y_1*(\omega)$ to $Y_1^*(\omega)$. (The asterisk is indicating complex conjugate of Y_1).
164	Eq. 4.19	Multiple errors. Corrected equation is $y(t)=\begin{cases}\alpha\left(t-(T_M-\tau)\right), & T_M-\tau\le t\le T_M\\ \alpha\left((T_M+\tau)-t\right), & T_M\le t\le T_M+\tau\\ 0, & \text{otherwise}\end{cases}$

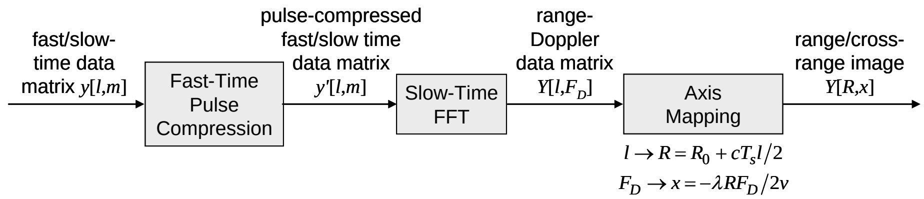
Page	***Location on Page***	***Correction***
168	Eq. 4.28	Missing j in the exponential in the 3rd line. Corrected equation is (3rd line only shown) $=\dfrac{\alpha}{j(\Omega_D-\Omega_i)}\exp\left[j(\Omega_D-\Omega_i)s\right]\Big\vert_0^{\tau}$
169	6th text line from bottom	Change "Sec. 4.6.2" to "Sec. 4.6.4".
172	Eq. 4.47	Missing the term $\exp(j2\pi F_D t)$ in the second line. The corrected equation is $\hat{A}(-t,-F_D)=\int_{-\infty}^{\infty}x(s'-t)\exp\left(-j2\pi F_D(s'-t)\right)x^*(s')\,ds'$ $=\exp(j2\pi F_D t)\int_{-\infty}^{\infty}x(s'-t)\exp(-j2\pi F_D s')x^*(s')\,ds'$ $=\exp(j2\pi F_D t)\hat{A}^*(t,F_D)$
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 $Y[l,\omega_D;\omega)$
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 …".
192	Eq. 4.86	Change $x(t_0)$ to $A(t_0)$. Also, poor typography of first exponential. Thus, change $X(\Omega)\approx\sqrt{\dfrac{-2\pi}{\phi''(t_0,\Omega)}}\,e^{-j\frac{\pi}{4}}\,x(t_0)e^{j\phi(t_0,\Omega)}$ to $X(\Omega)\approx\sqrt{\dfrac{-2\pi}{\phi''(t_0,\Omega)}}\,e^{-j\pi/4}\,A(t_0)e^{j\phi(t_0,\Omega)}$
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 typography errors (excessively small type, exponentials elevated too high) in Eq. 4.86 appear in 4.91 in multiple places. The corrected equation is: $X(\Omega)\approx\sqrt{\dfrac{-2\pi}{\phi''(t_0,\Omega)}}\,e^{-j\frac{\pi}{4}}\,A(t_0)e^{j\phi(t_0,\Omega)}$ $=\sqrt{\dfrac{-2\pi}{2\alpha}}\,e^{-j\frac{\pi}{4}}\,A\left(\dfrac{\Omega}{2\alpha}\right)e^{j\left[\alpha(\Omega/2\alpha)^2-\Omega(\Omega/2\alpha)\right]}$ $=j\sqrt{\dfrac{\pi}{\alpha}}\,e^{-j\frac{\pi}{4}}\,A\left(\dfrac{\Omega}{2\alpha}\right)e^{-j\left(\Omega^2/4\alpha\right)}$

Page	Location on Page	Correction
193	Eq. 4.93	The typography errors (excessively small type, exponentials elevated too high) in Eqs. 4.86 and 4.91 appear in 4.93 also. The corrected equation is: $X(\Omega) \approx j\sqrt{\frac{\pi}{\alpha}}\, e^{-j\frac{\pi}{4}}\, e^{-j\left(\Omega^2/4\alpha\right)}, \quad -2\pi\left(\frac{\beta}{2}\right) \le \Omega \le +2\pi\left(\frac{\beta}{2}\right)$
201	Eq. 4.112	The exponential in the last term should be $j\Omega(t\text{-}t_b)$ instead of $j\Omega t$. The corrected equation is $\bar{x}(t) = \zeta \exp\left(j\pi\frac{\beta}{\tau}(t-t_b)^2\right)\exp\left(j2\pi F_D t\right)\exp\left(j\Omega(t-t_b)\right), \quad 0 \le t - t_b \le \tau$
201	Eq. 4.113	The change in Eq. 4.112 results in the following modification to 4.113:: $y(t) = \varsigma \exp\left[-j\left(2\pi\left(\frac{\beta}{\tau}\Delta t_b - F_D\right)t - 2\pi\frac{\beta}{\tau}\Delta t_b t_0 + \Omega t_b\right)\right]\exp\left(j\pi\frac{\beta}{\tau}(\Delta t_b)^2\right)$
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."
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 $F\tau_c$.
226	End of 1st paragraph	Change "… Eaves and Reddy (1988), …" to "… Eaves and Reedy (1987), …" (note two corrections).
233	Eq. 5.4	Missing the term $(-1)^m$ in the intermediate result. The corrected equation is $h_N[m] = (-1)^m \binom{N-1}{m} = (-1)^m \frac{(N-1)!}{m!(N-1-m)!}, \quad m = 0,\ldots,N-1$
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 $t_m = t_0 + \sum_{p=0}^{m-1} T_{((p))_P}, \quad m = 0,\ldots,\infty$

Page	***Location on Page***	***Correction***
243	Eq. 5.41	Change $\lvert y[m]\rvert^2$ to $\lvert z[m]\rvert^2$. Corrected equation is $$\left\lvert H_{2,P}\left(F_0\right)\right\rvert^2 = \frac{\frac{1}{P}\sum_{m=0}^{P-1}\left\lvert z[m]\right\rvert^2}{\left\lvert x[m]\right\rvert^2} = \frac{4A^2\sum_{m=0}^{P-1}\sin^2\left(\pi F_0 T_m\right)}{PA^2}$$
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."
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".
261	last line before Eq. (5.89)	Change "… vector **x** the output **h**′**x** of …" to "… vector **y** the output **h**′**y** of …"
261	Eq. (5.89)	Change the left-hand side from **h**′**x** to **h**′**y**.
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, …".

Page	***Location on Page***	***Correction***
276	Eq. 5.120	Missing equals sign between the two integrals. Corrected equation is $\hat{P}_y = \frac{1}{2\pi}\int_{-\pi}^{+\pi} S_y(\omega)\,d\omega = \frac{1}{2\pi}\int_{-\pi}^{+\pi} \lvert Y(\omega)\rvert^2\,d\omega$
289	Eq. 5.138	Change the equation to $M_s = \frac{d_{pc}}{vT}$.
293	Eaves & Reedy reference	Change date from 1988 to 1987.
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 …"
314	Eq. 6.39	There is a sign error on the phase angle θ in the first line of the equation. The corrected equation is $p_{\mathbf{y}}(\mathbf{y}\mid H_1,\theta) = \frac{1}{\pi^N \beta^{2N}} \exp\left[-\frac{1}{\beta^2}\left(\mathbf{y}^H\mathbf{y} - 2\,\mathrm{Re}\left\{\tilde{\mathbf{m}}^H\mathbf{y}e^{-j\theta}\right\} + E\right)\right] = \frac{1}{\pi^N \beta^{2N}} \exp\left[-\frac{1}{\beta^2}\left(\mathbf{y}^H\mathbf{y} - 2\left\lvert\tilde{\mathbf{m}}^H\mathbf{y}\right\rvert\cos(\phi-\theta) + E\right)\right]$
314	Eq. 6.40	The typesize on the $1/\beta^2$ term in the exponential is poor. The boldface **E** in the same exponent should be non-bold italic E instead, and θ should be θ' in them cosine and the differential. The corrected equation is $p_{\mathbf{y}}(\mathbf{y}\mid H_1) = \frac{1}{\pi^N \beta^{2N}} e^{-\frac{1}{\beta^2}\left(\mathbf{y}^H\mathbf{y}+E\right)} \frac{1}{2\pi}\int_0^{2\pi} \exp\left[\frac{2}{\beta^2}\left\lvert\tilde{\mathbf{m}}^H\mathbf{y}\right\rvert\cos\theta'\right] d\theta'$

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 $$(6.66):\quad \Lambda = \prod_{n=0}^{N-1} e^{-\tilde{m}^2/\beta^2} I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right) = e^{-N\tilde{m}^2/\beta^2}\prod_{n=0}^{N-1} I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right) \mathop{\gtrless}_{H_0}^{H_1} -\lambda$$ $$(6.67):\quad \ln\Lambda = -\frac{N\tilde{m}^2}{\beta^2} + \sum_{n=0}^{N-1}\ln\left[I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right)\right] \mathop{\gtrless}_{H_0}^{H_1} \ln(-\lambda)$$ $$(6.68):\quad \sum_{n=0}^{N-1}\ln\left[I_0\left(\frac{2\tilde{m}z_n}{\beta^2}\right)\right] \mathop{\gtrless}_{H_0}^{H_1} \ln(-\lambda) + \frac{N\tilde{m}^2}{\beta^2} \equiv T$$
326	2nd paragraph, 3rd line	Change $z' = \sum (z_n')^2 = z^2/\beta^2$ to $z' = \sum (z_n')^2 = z/\beta^2$.
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, …"
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".
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 $x_P = R\sin\theta_P = \frac{\lambda R F_{DP}}{2v}$.

Page	***Location on Page***	***Correction***
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).
413	Fig. 8.19	Change F to F_D in the transformations under the last block in the diagram. The corrected figure is as follows: 
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."
422	Eq. 8.44	Change the "=" sign in the last line only to approximately equal sign "≈".
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 $\mathscr{H}(K_u,\Omega;R_0)=\int_{-\infty}^{+\infty}\exp\left\{-j\left[K_u u+\Omega\left(\delta R+\sqrt{(u-x)^2+R_0^2}\right)\right]\right\}du$
428	Eq. 8.56	Make it clear that the two lines on the right-hand side are all part of the same integral. The corrected equation is $y(t)=w(t)\int_{-\infty}^{+\infty}\tilde{\rho}(\delta t)\exp\left[-j\left(\Omega_0+2\pi\frac{\beta}{\tau}(t-t_0)\right)\delta t\right]\bullet\ldots$ $\ldots\bullet\exp\left(j\pi\frac{\beta}{\tau}(\delta t)^2\right)d(\delta t)$
429	Eq. 8.59 and 8.60	This is just poorly expressed by the author. 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	A source credit should be added at the bottom of the table. It should read: Source: Kennedy, 1988*b*
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 $\left(1-\frac{1}{(M-1)^2}\right)^{-1}$

Page	***Location on Page***	***Correction***
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 "… in radians …" to "… 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 $\pm 2\pi d/\lambda$;".
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 "… $\kappa = \sigma^2$ …".
475	Eq. 9.27	The middle index of the middle entry in the vector should be "1" instead of "0". The corrected equation is $\mathbf{y} = \begin{bmatrix} y[l_0,0,0] \\ y[l_0,0,1] \\ \vdots \\ y[l_0,0,N-1] \\ y[l_0,1,0] \\ y[l_0,1,1] \\ \vdots \\ y[l_0,1,N-1] \\ \vdots \\ y[l_0,M-1,0] \\ y[l_0,M-1,1] \\ \vdots \\ y[l_0,M-1,N-1] \end{bmatrix}$
481	Eq. (9.46)	Change χ_c to χ_t. The corrected equation is $\chi_0 = MN\chi_t$.
484	Eq. 9.53	Because of the earlier change to Eq. 5.138, 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 $\mathbf{h}_1 \Rightarrow h_1[m,n] = \delta[m,n] - \delta[m+M_s, n+1]$

Page	***Location on Page***	***Correction***
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 $$H_1\left(\omega_D,\tilde{K}_\theta\right)=\sum_{m=0}^{M_s-1}\sum_{n=0}^{1}h_1[m,n]e^{-j\left(m\omega_D+n\tilde{K}_\theta\right)}$$ $$=1-\exp\left[-j\left(-M_s\omega_D-\tilde{K}_\theta\right)\right]$$ $$=1-\exp\left[j\left(M_s\omega_D+\tilde{K}_\theta\right)\right]$$ $$=1-\exp\left[j\left(M_s\omega_D-K_\theta\right)\right]$$ (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.
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.

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