ERRATA: Airplane Flight Dynamics and Automatic Flight Controls Part I

Year of Print, 2011
(Errata Revised August 7, 2018)

Please check the website www.darcorp.com for updated errata

page 28, Line 9	'un' should be 'in'
page 34, Line 25	Should read 'Roskam, J.; Airplane Design, Parts I through VIII; Design, Analysis, and Research Corporation, 1440 Wakarusa Drive Suite #500, Lawrence, KS 66049, USA; 1990'
page 40, Line 26	Should read '… apply to cambered (un-symmetrical) airfoils.'
page 59, Figure 2.20	Flap Chord, c_f, should go from hinge line to trailing edge
page 66, Figure 3.2	β should be β_1 in Note 3
page 84, Equation (3.30)	Should read:

$$M_A = M_{ac_{wf}} + L_{wf}\left(x_{cg} - x_{ac_{wf}}\right)\cos(\alpha) - L_h\left(x_{ac_h} - x_{cg}\right)\cos(\alpha - \varepsilon)$$

page 97, Figure 3.28	Normal velocity vector on left wing should not be present
page 99, Figure 3.30	Axis labeled as 'Z' should be labeled as 'X'
page 106, Equation (3.67)	K_{SW} needs to be defined: is the gearing constant between cockpit control wheel or stick and aileron or spoiler deflection
page 111, Equation (3.76)	Should read: $F_{A_{y_v}} = C_{y_{\beta_v}} \beta \bar{q} S = -C_{L_{\alpha_v}} \left(1 - \frac{d\sigma}{d\beta}\right) \beta \bar{q}_v S_v$
page 115, Line 14	Should read 'The yawing moment due to the vertical tail may be written as:'
page 117, Line 9	After Line 9, should read 'Methods for computing the yawing moment due to aileron control derivative are found in Part VI of Reference 3.1.'

page 117, Line 18-19	Lines 18-19 should read 'Methods for computing the yawing moment due to spoiler control derivative are found in Part VI of Reference 3.1.'
page 118, Figure 3.46	'Positive rolling moment' should be 'Positive yawing moment'
page 118, Figure 3.46, Note 1	'induces drag' should be 'induced drag'
page 122, Equation (3.92a)	Should read: $L_{T_{1_s}} = L_T = \left[\sum_{i=1}^{i=n} T_i\left(-z_{T_i}\cos\phi_{T_i}\sin\psi_{T_i} - y_{T_i}\sin\phi_{T_i}\right)\right]\cos\alpha_1 + \left[\sum_{i=1}^{i=n} T_i\left(-x_{T_i}\cos\phi_{T_i}\sin\psi_{T_i} - y_{T_i}\cos\phi_{T_i}\cos\psi_{T_i}\right)\right]\sin\alpha_1$
page 122, Equation (3.92b)	Should read: $F_{T_{y_1}} = F_{T_y} = \sum_{i=1}^{i=n} T_i\left(\cos\phi_{T_i}\sin\psi_{T_i}\right)$
page 122, Equation (3.92c)	Should read: $N_{T_{1_s}} = N_T = \left[\sum_{i=1}^{i=n} T_i\left(-x_{T_i}\cos\phi_{T_i}\sin\psi_{T_i} - y_{T_i}\cos\phi_{T_i}\sin\psi_{T_i}\right)\right]\cos\alpha_1 + -\left[\sum_{i=1}^{i=n} T_i\left(-z_{T_i}\cos\phi_{T_i}\sin\psi_{T_i} - y_{T_i}\sin\phi_{T_i}\right)\right]\sin\alpha_1$
page 124, Equation (3.95b)	The summation should say $i=1$
page 126, Table 3.4	'V_1' should be 'Q_1'
page 127, Line 4	Should read '2) partial derivatives in Table 3.4 indicate the slope by which a particular perturbed force or moment is affected by a particular perturbed variable.'
page 133, Figure 3.51	'V_{P_1}' should be 'V_p' in all cases

page 134, Figure 3.52	‘ $\arctan \left.\frac{\partial C_D}{\partial M}\right\rvert_{M=M_2} > 0$ ’ should be ‘ $\arctan \left.\frac{\partial C_D}{\partial M}\right\rvert_{M=M_2} < 0$ ’
page 134, Figure 3.52	Caption should read ‘Example of Determination of: $\partial C_D / \partial M$ at a constant angle of attack’
page 136, Equation (3.119)	Should read: $C_{L_u} = \frac{M_1^2}{\left(1-M_1^2\right)} C_{L_1}$
page 136, Equation (3.122)	Should read: $\frac{\partial M_A}{\partial\left(\frac{u}{U_1}\right)} = \left(C_{m_u} + 2C_{m_1}\right)\bar{q}_1 S\bar{c}$
page 147, Equation (3.162)	‘ $\frac{\alpha\bar{c}}{2U_1}$ ’ should be ‘ $\frac{\dot{\alpha}\bar{c}}{2U_1}$ ’
page 148, Line 28	‘sideslip angle, β ’ should be ‘sideslip rate, $\dot{\beta}$ ’
page 162, Equation (3.197)	‘ Cn_p ’ should be ‘ C_{n_p} ’
page 162, Equation (3.197)	‘ Cn_r ’ should be ‘ C_{n_r} ’
page 182, Line 2	Should read ‘Roskam, J.; Airplane Design, Parts I through VIII; Design, Analysis, and Research Corporation, 1440 Wakarusa Drive, Lawrence, KS 66049, USA; 1990’
page 182, Line 16	Should read ‘Lan, C.E. and Roskam, J.; Airplane Aerodynamics and Performance; Design, Analysis, and Research Corporation, 1440 Wakarusa Drive, Lawrence, KS 66049, USA; 1990’
page 195, Line 6	‘Table 5.1’ should be ‘Table 4.1’
page 196, Line 2	‘Table 5.1’ should be ‘Table 4.1’
page 199, Line 9	Should read: ‘Where: $C_{L_1} \approx \frac{mg}{\bar{q}_1 S}$. Note that $\cos\gamma_1 \approx 1.0$, which…’

page 202, Line 6 ‘ $C_{L_1} = \frac{mg}{\bar{q}_1 S}$ ’ should be ‘ $C_{L_1} \approx \frac{mg}{\bar{q}_1 S}$ ’

page 209, Figure 4.11b The negative tail stall locus as shown in the diagram is wrong. The trim diagram should have a positive tail stall locus at α = 25° and a negative tail stall locus at α = -12°. Both of these lines are out of the range of the diagram so none of them should be shown.

page 211, Line 11 The sentence that reads, ‘Figure 4.11b shows only the negative tail stall locus because the positive locus is outside of the diagram’ should be removed

page 225, Equation (4.86b) Should read:

$$mU_1 R_1 - mg\sin\phi_1 = \left(C_{y_\beta}\beta_1 + C_{y_r}\frac{R_1 b}{2U_1} + C_{y_{\delta_a}}\delta_{a_1} + C_{y_{\delta_r}}\delta_{r_1} \right)\bar{q}_1 S$$

page 226, Line 18 Should read ‘By combining Eqns (4.85b) and (4.85c) with…’

page 227, Equation (4.96) Should read:

$$0 = \left(C_{y_\beta}\beta_1 + C_{y_r}\frac{R_1 b}{2U_1} + C_{y_{\delta_a}}\delta_{a_1} + C_{y_{\delta_r}}\delta_{r_1} \right)\bar{q}_1 S$$

page 227, Equation (4.97) ‘ ϕ ’ should be ‘ ϕ_1 ’

page 227, Equation (4.103b) ‘ ϕ ’ should be ‘ ϕ_1 ’

page 227, Equation (4.103c) ‘ ϕ ’ should be ‘ ϕ_1 ’

page 227, Line 6 The first sentence should be removed.

page 228, Equation (4.98) Variables a_{11}, b_{11} *and* c_{11} should be a, b and c

page 228, Equation (4.99) Variables a_{11}, b_{11} *and* c_{11} should be a, b, and c

page 228, Equation (4.100) Variables a_{11}, b_{11} *and* c_{11} should be a, b, and c

page 228, Equation (4.102a) ‘ ϕ ’ should be ‘ ϕ_1 ’

page 228, Equation (4.102b) ‘ ϕ ’ should be ‘ ϕ_1 ’

page 228, Equation (4.102c) ‘ ϕ ’ should be ‘ ϕ_1 ’

page 228, Equation (4.102a) ‘ a_{11} ’ should be ‘a’

page 228, Equation (4.102b) ‘ b_{11} ’ should be ‘b’

page 228, Equation (4.102c) ‘ c_{11} ’ should be ‘c’

page 232, Equation (4.113b) ‘ γ_1 ’ should be ‘ Θ_1 ’

page 232, Equation (4.114a) ‘ γ_1 ’ should be ‘ Θ_1 ’

page 234, Figure 4.21 Arrow for $M_{ac_{wf}}$ should act on the A.C. of the wing-fuselage not the C.G.

page 237, Equation (4.131) Should read:

$$L_c\left(x_{cg}-x_{ac_c}\right)-L_{wf}\left(x_{ac_{wf}}-x_{cg}\right)+M_{ac_{wf}}-L_h\left(x_{ac_h}-x_{cg}\right)=0$$

page 237, Lines 10-11 Should read ‘From Eqn (4.133) it may be concluded that as long as L_h is positive (i.e. ‘up’) and $(x_{ac_{wf}}-x_{cg})$ is positive the canard load to trim, L_c, will also be positive (i.e. ‘up’).’

page 259, Figure 4.36a ‘ $\delta_e = 2°$ ’ should be ‘ $\delta_{t_e} = 2°$ ’

page 259, Figure 4.36b ‘ $\frac{dF_e}{dV}$ ’ should be ‘ $\frac{dF_s}{dV}$ ’

page 263, Line 2 Should read ‘Next, recall the stick-force equation …’

page 268, Line 14 Include in τ_r definition: ‘ $\tau_r = \frac{\partial\beta}{\partial\delta_r}$ and is normally negative’

page 269, Equation (4.199) Should read: $C_{n_{\beta_{free}}} = C_{n_{\beta_{fix}}} + C_{n_{\delta_r}} \frac{C_{h_{\beta_V}}}{C_{h_{\delta_r}}}\left(1-\frac{\partial\sigma}{\partial\beta}\right)$

page 269 Equation (4.203)	Should read: $\dfrac{\partial F_r}{\partial \beta} = -\dfrac{G_r \eta_v \bar{q}_1 S_r \bar{c}_r C_{h_{\delta_r}}}{C_{n_{\delta_r}}} C_{n_{\beta_{free}}}$
page 273, Line 4	Should read 'or, with Eqn (4.208) as:'
page 278, Line 6	Should read 'HM is the elevator hinge moment as expressed by Eqn (4.136)'
page 278, Line 22	Should read, 'The hingemoment coefficient equation…'
page 278, Line 26	Equation '4.225' should be '4.225a'
page 280, Line 16	'$\dfrac{\partial \delta_e}{\partial n}$' should be '$\dfrac{\partial F_s}{\partial n}$'
page 286, Equation (4.241)	'$C_{h_{\beta_r}}$' should be '$C_{h_{\beta_v}}$'
page 288, Line 15	Should read '… at the instant of rotation: no load on the nose-gear.'
page 288, Equation (4.245)	Should read: $D_g = C_{D_g} \bar{q}_{rotate} S$
page 288, Line 27	'$C_{D_{ground}}$' should be 'C_{D_g}'
page 290, Equation (4.246)	Should read: $L_{wf_g} = C_{L_{wf_g}} \bar{q}_{rotate} S$
page 290, Line 3	'$C_{L_{wf_{ground}}}$' should be '$C_{L_{wf_g}}$'
page 290, Equation (4.247)	Should read: $L_{h_g} = C_{L_{h_g}} \eta_{h_g} \bar{q}_{rotate} S_h$
page 290, Line 6	'$C_{L_{h_{ground}}}$' should be '$C_{L_{h_g}}$'
page 290, Equation (4.248)	Should read: $M_{ac_{wf_g}} = C_{m_{ac_{wf_g}}} \bar{q}_{rotate} S\bar{c}$
page 290, Line 18	'$C_{m_{ac_{wf_{ground}}}}$' should be '$C_{m_{ac_{wf_g}}}$'

page 291, Equation (4.250)	‘ $\ddot{\theta}$ ’ should be ‘ $\ddot{\theta}_{mg}$ ’
page 291, Equation (4.250)	‘ $C_{L_{\max h_{ground}}}$ ’ should be ‘ $C_{L_{\max h_g}}$ ’
page 292, Table 4.10	‘ $C_{D_{ground}}$ ’ should be ‘ C_{D_g} ’
page 292, Table 4.10	‘ $C_{L_{wf_{ground}}}$ ’ should be ‘ $C_{L_{wf_g}}$ ’
page 292, Table 4.10	‘ $C_{L_{\max h_{ground}}}$ ’ should be ‘ $C_{L_{\max h_g}}$ ’
page 292, Figure 4.52b	‘ $x_{cg_g} = 38\ ft$ ’ should be ‘ $x_{cg_g} = 39\ ft$ ’ and vice versa
page 305, Figure 5.2	‘ t_1 ’ should be ‘ t_0 ’ in all cases
page 314, Figure 5.6	Solid black line should be removed
page 316, Line 9	‘the system is zero’ should be ‘the system are zero’
page 324, Line 16	Should read ‘Response of the airplane to control …’
page 328, Equation (5.48)	Should read: $\dfrac{C_{m_\alpha}}{C_{L_\alpha} + C_{D_1}} < \dfrac{C_{m_u}}{C_{L_u} + 2C_{L_1}}$
page 328, Equation (5.49)	Should read: $\dfrac{C_{m_\alpha}}{C_{L_\alpha}} = \left(\bar{x}_{cg} - \bar{x}_{ac_A}\right) < \dfrac{C_{m_u}}{C_{L_u} + 2C_{L_1}}$
page 333, Line 8	Should read ‘ $T_1 = -0.35\,\text{sec}$ and $T_2 = 0.28\,\text{sec}$’
page 342, Equation (5.82a)	‘ $\dfrac{2\zeta_p s}{\omega_{n_{sp}}}$ ’ should be ‘ $\dfrac{2\zeta_p s}{\omega_{n_p}}$ ’
page 342, Equation (5.82b)	‘ $\dfrac{2\zeta_p s}{\omega_{n_{sp}}}$ ’ should be ‘ $\dfrac{2\zeta_p s}{\omega_{n_p}}$ ’
page 342, Equation (5.82b)	‘ $\dfrac{2\zeta_\alpha}{\omega_{n_\alpha}}$ ’ should be ‘ $\dfrac{2\zeta_\alpha s}{\omega_{n_\alpha}}$ ’

page 342, Equation (5.82c)	‘ $\frac{2\zeta_p s}{\omega_{n_{sp}}}$ ’ should be ‘ $\frac{2\zeta_p s}{\omega_{n_p}}$ ’
page 350, Line 6	‘ $\phi(s)/\delta_e(s)$ ’ should be ‘ $\phi(s)/\delta(s)$ ’
page 364, Line 28	‘Eqn (5.120)’ should be ‘Eqn (5.121)’
page 381, Figure 5.24	‘-1/T’ should be ‘1/T’ on vertical axis
page 381, Figure 5.25	‘-1/T’ should be ‘1/T’ on vertical axis
page 382, Figure 5.26	‘-1/T’ should be ‘1/T’ on vertical axis
page 382, Figure 5.27	‘-1/T’ should be ‘1/T’ on vertical axis
page 384, Figure 5.28	‘-1/T’ should be ‘1/T’ on vertical axis
page 384, Figure 5.29	‘-1/T’ should be ‘1/T’ on vertical axis
page 385, Figure 5.30	‘-1/T’ should be ‘1/T’ on vertical axis
page 385, Figure 5.31	‘-1/T’ should be ‘1/T’ on vertical axis
page 387, Figure 5.32	‘-1/T’ should be ‘1/T’ on vertical axis
page 387, Figure 5.33	‘-1/T’ should be ‘1/T’ on vertical axis
page 388, Figure 5.34	‘-1/T’ should be ‘1/T’ on vertical axis
page 388, Figure 5.35	‘-1/T’ should be ‘1/T’ on vertical axis
page 390, Figure 5.36	‘-1/T’ should be ‘1/T’ on vertical axis
page 390, Figure 5.37	‘-1/T’ should be ‘1/T’ on vertical axis
page 392, Figure 5.38a	‘-1/T’ should be ‘1/T’ on vertical axis
page 392, Figure 5.38b	‘-1/T’ should be ‘1/T’ on vertical axis
page 393, Figure 5.39	‘-1/T’ should be ‘1/T’ on vertical axis
page 393, Figure 5.40	‘-1/T’ should be ‘1/T’ on vertical axis
page 394, Figure 5.41	‘-1/T’ should be ‘1/T’ on vertical axis

page 394, Figure 5.42	'-1/T' should be '1/T' on vertical axis
page 396, Line 25	Should read '… say 10 deg/deg/sec, a 3 deg/s pitch rate …'
page 398, Line 2	'elevator deflection' should be 'rudder deflection'
page 401, Figure 5.44	On the Y_B vector, the smaller vector should be labeled 'q'
page 405, Lines 24-28	Remove paragraph contained by lines 24-28
page 407, Line 14	'$\cos\theta = 0$' should be '$\cos\theta = 1$'
page 427, Line 6	Remove the return so "be" and "written" are on the same line.
page 427, Line 7	'time to double' should be 'time-to-double'
page 434, Line 12	'Reference 6.5' should be 'Reference 6.6'
page 460, Line 21	Should read 'Roskam, J.; Airplane Design, Parts I through VIII; Design, Analysis, and Research Corporation, 1440 Wakarusa Drive Suite #500, Lawrence, KS 66049, USA; 1990'
page 461, Lines 20-23	Should read '1440 Wakarusa Drive Suite #500, Lawrence, KS 66049, USA Tel. 785-832-0434'
page 466, Line 26	Should read 'Design, Analysis, and Research Corporation, 1440 Wakarusa Drive Suite #500, Lawrence, KS 66049, USA'
page 466, Line 29	Should read 'Design, Analysis and Research Corporation, 1440 Wakarusa Drive, Suite #500, Lawrence, KS 66049, USA Tel. 785-832-0434'
Appendix B	'$C_{h_{\beta_r}}$' should be '$C_{h_{\beta_v}}$' for all examples
page 480, Table B1	C.G. location should be $0.264\bar{c}$
page 487, Table B2	C.G. location should be $0.33\bar{c}$
page 501, Table B4	C.G. location should be $0.27\bar{c}$
page 560, Line 18	Should read 'Roskam, J.; Airplane Design, Parts I through VIII; Design, Analysis, and Research Corporation, 1440

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