

ERRATA: Airplane Flight Dynamics and Automatic Flight Controls Part I

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- page 14, Section 1.4* Last paragraph, 1st line “ $\Theta = 90$)” should be “ $\Theta = 90$ ”
- page 26, Eqn (1.62)* First equation set “ $\bar{\omega} = k\dot{\Theta}$ ” should be “ $\bar{\omega} = j_2\dot{\Theta}$ ”
- page 28, Line 9* “un” should be in.
- page 34, Lines 25-26* Reference should be: 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, Eqn (3.30)* The wing incidence should be remove
- page 85* 19th line “as well a positive” should be “as well as positive”
- 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 104* Last paragraph, last line “right wheel deflection are activated” should be “right wheel deflection) are activated”
- page 106, Eqn (3.67)* K_{SW} needs to be defined: is the gearing constant between cockpit control wheel or stick and aileron or spoiler deflection.
- page 108, Eqn (3.71)* change $C_{l\delta_r} = C_{L\alpha_v} \alpha_{\delta_r} \eta_v \frac{S_v x_{v_s}}{Sb}$ to $C_{l\delta_r} = C_{L\alpha_v} \alpha_{\delta_r} \eta_v \frac{S_v z_{v_s}}{Sb}$

- page 111, Eqn (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* “The yawing moment due to the vertical tail me be written as:” should be “The yawing moment due to the vertical tail may be written as:”
- page 117, Line 20* Line 20 should be between Lines 13 and 14.
- page 118, Figure 3.46* “Positive rolling moment” should be labeled as “Yawing moment”.
- page 118, Figure 3.46, 1.)* “induces drag” should be “induced drag”
- page 122, Eqn 3.92a* The summation should say $i = 1$
- page 122, Eqn 3.92b* The summation should say $i = 1$
- page 122, Eqn 3.92c* The summation should say $i = 1$
- page 124, Eqn 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* All “ V_{p_i} ” in this figure should be “ V_p ”
- page 133, Figure 3.51* All “ V_{p_i} ” in this figure should be “ V_p ”
- page 134, Figure 3.52* Equation “ $\arctan \frac{\partial C_D}{\partial M} \Big|_{M=M_2} > 0$ ” should be “ $\arctan \frac{\partial C_D}{\partial M} \Big|_{M=M_2} < 0$ ”.
Figure should be labeled “Example of Determination of: $\partial C_D / \partial M$ at a constant angle of attack”.
- page 136, Eqn (3.119)* “ C_L ” should be “ C_{L_1} ”
- page 136, Eqn (3.122)* Variable M should be “ M_A ”
- page 141, Eqn (3.142)* change “airplane, caused by” to “airplane, ΔC_L caused by”

page 145, Eqn (3.156) change $\frac{\partial M_A}{\partial \left(\frac{q\bar{c}}{2U_1} \right)} = \frac{\partial C_m}{\partial \left(\frac{q\bar{c}}{2U_1} \right)} \bar{q}_1 S = C_{m_q} \bar{q}_1 S$ to

$$\frac{\partial M_A}{\partial \left(\frac{q\bar{c}}{2U_1} \right)} = \frac{\partial C_m}{\partial \left(\frac{q\bar{c}}{2U_1} \right)} \bar{q}_1 S \bar{c} = C_{m_q} \bar{q}_1 S \bar{c}$$

page 147, Eqn (3.162) “ $\frac{\alpha\bar{c}}{2U_1}$ ” should be “ $\frac{\dot{\alpha}\bar{c}}{2U_1}$ ”

page 148, Section 3.2.10 First paragraph “changes in sideslip, β ” should be “changes in sideslip rate, $\dot{\beta}$ ”
Second paragraph “sideslip angle, β ” should be “sideslip rate, $\dot{\beta}$ ”

page 162, Eqn (3.197) “ C_{n_p} ” and “ C_{n_r} ” should be “ $C_{n_{\dot{p}}}$ ” and “ $C_{n_{\dot{r}}}$,” respectively.

page 182, Lines 2-3, 17-18 Reference should be: Roskam, J.; Airplane Design, Parts I through VIII; Design, Analysis, and Research Corporation, 1440 Wakarusa Drive, Lawrence, KS 66049, USA; 1990

page 190 Line 6, “criterion (4.1)” should be “criterion (4.10)”
Line 11, $C_{Z_{T\alpha}} \ll C_{L\alpha}$ should be $C_{T_{z\alpha}} \ll C_{L\alpha}$

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 206 Last paragraph, 3rd line, “in Example 1.” should be “in Example 1).”

page 209, Fig 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 $\alpha = 25^0$ and a negative tail stall locus at $\alpha = -12^0$. Both of these lines are out of the range of the diagram so none of them should be shown.

page 211, 11th line 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 211 11th line, “deg respectively” should be “deg respectively”

- page 216 15th line, “Appendix A..” should be “Appendix A.”
- page 220, Eqn (4.81) change $V_{mc} = \sqrt{\frac{2(N_{T1} + \Delta N_{D1})}{\rho C_{n\delta_r} \delta_{r_{max}} Sb}}$ to $V_{mc} = \sqrt{\frac{-2(N_{T1} + \Delta N_{D1})}{\rho C_{n\delta_r} \delta_{r_{max}} Sb}}$
- page 225, Eqn (4.86b) “ C_{Y_r} ” should be “ C_{y_r} ”.
- page 225 Line 20, “three of these” should be “four of these”
- page 227, Eqn (4.96) “ C_{Y_r} ” should be “ C_{y_r} ”.
- page 227, Eqn (4.97)(4.103) “ ϕ ” should be “ ϕ_1 ”
- page 227, Line 6 The first sentence should be removed.
- page 228, Eqn (4.98) Variables a_{11} , b_{11} , and c_{11} should be a, b, and c
- page 228, Eqn (4.99) Variables a_{11} , b_{11} , and c_{11} should be a, b, and c
- page 228, Eqn (4.100) Variables a_{11} , b_{11} , and c_{11} should be a, b, and c
- page 228, Eqn (4.102) “ ϕ ” should be “ ϕ_1 ”
- page 228, Eqn (4.102a) Variable a_{11} should be a.
- page 228, Eqn (4.102b) Variable b_{11} should be b.
- page 228, Eqn (4.102c) Variable c_{11} should be c.
- page 232, Eqn (4.113b) “ γ_1 ” should be “ Θ_1 ”
- page 232, Eqn (4.114a) “ γ_1 ” should be “ Θ_1 ”
- page 235 Last line, “for a conventional airplane” should be “for a canard airplane”
- page 237 Line 7, “in Eqn (4.10)” should be “in Eqn (4.131)”
- 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’).

<i>page 242, Eqn (4.136)</i>	change $HM = C_h \bar{q} S_e \bar{c}_e$ to $HM = C_h \bar{q}_h S_e \bar{c}_e$
<i>page 244, Section 4.5.1</i>	Last paragraph, change $\eta_h = \frac{\bar{q}}{\bar{q}_h}$ to $\eta_h = \frac{\bar{q}_h}{\bar{q}}$
<i>page 253</i>	Last paragraph, 1 st line, “found by by” should be “found by”
<i>page 255</i>	Last paragraph, 2 nd line, “from Eqn 4.169)” should be “from Eqn (4.169)”
<i>page 259, Figure 4.36</i>	In graph a) “ $\delta_e = 2^\circ$ ” should be “ $\delta_{t_e} = 2^\circ$ ”
<i>page 259, Figure 4.36</i>	In graph b) “dFe/dV” should be “dFs/dV”
<i>page 263, Line 2</i>	Second “the” should be removed.
<i>page 269, Eqn 4.199</i>	“ $C_{n_{\beta_{fix}}} - C_{n_{\delta_r}}$ ” should be $C_{n_{\beta_{fix}}} + C_{n_{\delta_r}}$
<i>page 273, Line 4</i>	“and (4.209)” should be removed.
<i>page 278, Line 6</i>	HM should refer to Eqn (4.136).
<i>page 278, Eqn (4.225)</i>	Equation # 4.225 is repeated for two different equations.
<i>page 278, Line 22</i>	Should read, “The hingemoment coefficient equation...”
<i>page 278</i>	3 rd line from last line, equation “4.225” should be “4.225a”
<i>page 280, Line 15</i>	“ $\frac{\partial \delta_e}{\partial n}$ ” should be “ $\frac{\partial F_s}{\partial n}$ ”
<i>page 286, Eqn (4.241)</i>	$C_{h\beta_r}$ should be $C_{h\beta_v}$
<i>page 288, Line 2</i>	Sentence should read “Exceptions to this are airplanes like the B-52.”
<i>page 288, Line 14</i>	Remove “!” after “nose-gear.”
<i>page 288-290</i>	“ground” subscript should be “g”
<i>page 291, Eqn.(4.250)</i>	$\ddot{\theta}$ should be $\ddot{\theta}_{mg}$

<i>page 292, Figure 4.52b</i>	x_{cg_g} labels should be reversed for $x_{cg_g} = 38 \text{ ft}$ and $x_{cg_g} = 39 \text{ ft}$
<i>page 314, Figure 5.6</i>	Solid black line needs removed.
<i>page 316, Line 9</i>	Line is “the system is zero” should be “the system are zero”
<i>page 322, Eqn (5.35)</i>	change $B_u = -X_{\delta_e} \left\{ (U_1 - Z_{\dot{\alpha}}) M_q + Z_{\alpha} + M_{\dot{\alpha}} (U_1 + Z_q) + Z_{\delta_e} X_{\alpha} \right\}$ to $B_u = -X_{\delta_e} \left\{ (U_1 - Z_{\dot{\alpha}}) M_q + Z_{\alpha} + M_{\dot{\alpha}} (U_1 + Z_q) \right\} + Z_{\delta_e} X_{\alpha}$
<i>page 324, Line 16</i>	Remove the list number “1)” and align row to far left.
<i>page 328, Eqn (5.48)</i>	“>” should be “<”
<i>page 328, Eqn (5.49)</i>	“>” should be “<”
<i>page 333, Line 8</i>	$T_1 = -0.35$ and $T_2 = 0.28$
<i>page 342, Eqn (5.82a)</i>	In equation, “ $\frac{2\zeta_p s}{\omega_{n_p}}$ ” should be “ $\frac{2\zeta_p s}{\omega_{n_p}}$ ”
<i>page 342, Eqn (5.82b)</i>	In equation, “ $\frac{2\zeta_p s}{\omega_{n_p}}$ ” should be “ $\frac{2\zeta_p s}{\omega_{n_p}}$ ” and “ $\frac{2\zeta_{\alpha}}{\omega_{n_{\alpha}}}$ ” should be “ $\frac{2\zeta_{\alpha} s}{\omega_{n_{\alpha}}}$ ”
<i>page 342, Eqn (5.82c)</i>	In equation, “ $\frac{2\zeta_p s}{\omega_{n_p}}$ ” should be “ $\frac{2\zeta_p s}{\omega_{n_p}}$ ”
<i>page 350, Line 5</i>	“ $\phi(s) / \delta_e(s)$ ” should be “ $\phi(s) / \delta(s)$ ”
<i>page 364, Line 28</i>	Eqn (5.120) should be Eqn (5.121)
<i>page 381, Figure 5.24</i>	For Damping Ratio “-1/T” should be “1/T”
<i>page 381, Figure 5.25</i>	For Damping Ratio “-1/T” should be “1/T”
<i>page 396, Line 25</i>	Should read, “...say 10 deg/deg/sec, a 3 deg/s pitch rate...”
<i>page 398, Line 2</i>	“elevator deflection” should be “rudder deflection”
<i>page 401, Figure 5.44</i>	On the Y_B vector, the smaller vector should be labeled “q”
<i>page 405, Lines 24-28</i>	Omit paragraph contained by lines 24-28.

- page 407, Line 13* $\cos \theta = 1$ for small angles.
- 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, Lines 21-22* Reference should be: 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* Address should be: 1440 Wakarusa Drive Suite #500, Lawrence, KS 66049, USA Tel. 785-832-0434 Fax: 785-832-0524
- page 466, Lines 26-27* Lines should read “ Design, Analysis, and Research Corporation, 1440 Wakarusa Drive Suite #500, Lawrence, KS 66049, USA”
- page 466, Lines 29-31* Lines should read “Design, Analysis and Research Corporation, 1440 Wakarusa Drive, Suite #500, Lawrence, KS 66049, USA Tel. 785-832-0434 Fax: 785-832-0524
- Appendix B* $C_{h\beta_r}$ should be $C_{h\beta_v}$ for all examples.
- page 487, B2* C.G. location should be $0.33 \bar{c}$
- page 560, Lines 18-19* Reference should be: Roskam, J.; Airplane Design, Parts I through VIII; Design, Analysis, and Research Corporation, 1440 Wakarusa Drive Suite #500, Lawrence, KS 66049, USA; 1990