Addendum to *Flying on Your Own Wings*

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1 Introduction

This is an addendum to Chris Heintz's *Flying on Your Own Wings* (Third Edition) [2]. Here, I list the majority of the notes that I made in my personal copy as I worked through the book.

Note, I am not an engineer. I try to cite my sources in this addendum. I make no guarantees of the correctness of this document, and it is your responsibility to verify.

2 Corrections

2.1 Pg. 239 - Unit Correction

The equation for S produces a result in mm^2, not m^2.

2.2 Pg. 240 - Unit Correction

The equation for M produces a result in kgm, not m.

2.3 Pg. 244 - Formula Correction

The formula for M_T is incorrect. It should read as follows.

$$M_T = 0.04 \left(\frac{307}{14.4}\right)^2 \left(1.5^2\right) \left(3.45^2\right) \left(1.5^2\right) = 212\,\mathrm{kgm}$$

2.4 Pg. 247 - Result Correction

The calculation of N is incorrect.

$$N = \frac{M}{2 \times h} = \frac{830}{2 \times 0.5} = 830\,\mathrm{kg}$$

2.5 Pg. 247 - Unit Correction

The equation for σ_{Max} produces a result in $\mathrm{kg/mm}^2$, not $\mathrm{kg/mm}$.

2.6 Pg. 247 - Formula Correction

The calculation for $\mathcal{T}_0$ is shown. $\mathcal{T}$ is actually being calculated here.

2.7 Pg. 247 - Formula Correction

The calculation for K_{poss} should instead be:

$$K_{poss} = 500 \times 0.5^2 = 125\,\text{kg}$$

3 Clarifications

3.1 Pg. 185 - Kuhn's Diagonal Torsion Factor

The graph at the top of the page is pulled from NACA Technical Note 1364 [3]. Specifically, this references Equation 5:

$$K' = \tanh\left(\frac{1}{2}\log_{10}\frac{\mathcal{T}}{\mathcal{T}_0}\right)$$

You can find the graph in Figure 7 of that report.

3.2 Pg. 233 - Definition of $n_1\frac{W}{S}$

Note that the definition of $n_1\frac{W}{S}$ assumes W/S defined in *psf*.

3.3 Pg. 233 - Formula for V_{Cmini}

Note that the definition of V_{Cmini} is defined on Page 227.

3.4 Pg. 233 - Definition of C_n

Note that C_n was defined in Page 140.

3.5 Pg. 234 - Definition of V_{Csel}

Note that V_{Csel} is defined as follows.

$$V_{Csel} = \max\left(\left\{17\sqrt{n_1\frac{W}{S}}, 0.9V_H\right\}\right)$$

3.6 Pg. 236 - σ_{poss} Usage

Recall from Page 162 and Page 205 (for 6061-T6):

$$\sigma_{poss} = 24.6\frac{\text{kg}}{\text{mm}^2}$$

3.7 Pg. 236 - Definition of $\mathcal{T}_0$

Note that $\mathcal{T}_0$ was defined in Page 182.

4 Addendum

4.1 Pg. 206 - Cherry Commercial Rivets

Cherry rivets are now a very popular choice for homebuilts. Consider adding the following tables [1].

Prefix	3	4	5	6
Shear (Ultimate)	56.7	90.7	147.4	195 kg

Table 1: Cherry BS Rivets (Aluminum Head / Stainless Stem)

Prefix	3	4	5	6
Shear (Ultimate)	104.3	204.1	340.2	453.6 kg

Table 2: Cherry CC Rivets (Stainless Head / Stainless Stem)

4.2 Pg. 194 - Labeling Wing Loading Diagrams

You will likely want to label the wing loading diagrams.

(A) Symmetrical Loading

(B) Asymmetrical Loading

(C) With Fuselage Considered

References

[1] URL: `https://www.aircraftspruce.com/catalog/hapages/cherrynrivet.php`.

[2] C. Heintz. *Flying on Your Own Wings: A Complete Guide to Understanding Light Airplane Design*. Trafford Publishing, 2010. URL: `https://books.google.com/books?id=YcAuF6eDwZoC`.

[3] Paul Kuhn and James P Peterson. Strength analysis of stiffened beam webs. URL: `https://www.abbottaerospace.com/downloads/naca-tn-1364-strength-analysis-of-stiffened-beam-webs/`.

Revision History

Revision	Date	Author(s)	Description
1.0	7/28/23	CBL	created

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