

AEM 313 MEMO

Subject: Aerodynamics I Aircraft Project

TO: AEM 313

Date: 8 Nov 2016

CC:

Memo: AEM313-Proj-Assign

From: Charles O'Neill

REF:

Ext: 8-5161

Summary:

Design and construct an aircraft maximizing straight-line distance flown given one sheet of 36"x4" balsa, one paperclip and two rubber bands. Design report (50 pts) including concepts, analysis, and an aircraft photo are due on the 22nd November. Flight trials (50 pts) will be held indoors. Aircraft will be launched from an elevated level attitude. Design groups may be 1 or 2 students.

Discussion:

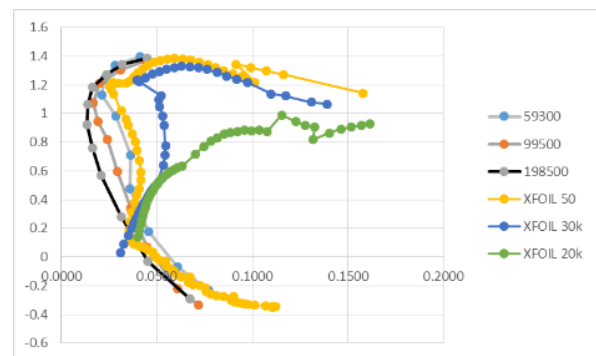
Distance flown means optimizing the lift/drag ratio. I suggest 1) drawing a few concepts: monoplane, biplane, canard, and 2) evaluate and optimize performance 3) flight test and iterate.

Grading

50% of from your report. 50% from the normalized flight distance.

Reynolds Number

These airplanes operate at low Reynolds numbers. Use XFOIL to determine CL and CD performance of airfoils. Traditional airfoils are probably not a good choice. You may wish to investigate flat and curved plates. Higher AR will give lower induced drag but at the expense of lower Re and thus higher profile drag.



Quarters:

US dimes and quarters are \$20/lb. Quarters are 0.0125 lbf each.

Balsa:

Available from the SupeStore on campus, Hobby Lobby in Northport, and online. I used 3/32", but 1/16" or even 1/32" might be a feasible option given your particular structure.