



BRIGHAM YOUNG UNIVERSITY  
AUVSI CAPSTONE TEAM (TEAM 45)

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## Airframe Subsystem Requirements Matrix

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ID	Rev.	Date	Description	Author	Checked By
AF-001	0.1	10-23-18	Initial Draft	Tyler Critchfield & Ryan Anderson	Derek Knowles
AF-001	0.2	11-06-18	Concept Development	Tyler Critchfield	Ryan Anderson & Kameron Eves
AF-001	1.1	2-12-19	Subsystem Engineering	Tyler Critchfield	CHECKED BY

# 1 Introduction

Figure 1 shows our updated Requirements Matrix for the Airframe subsystem. Section E has been added with the Target, Predicted, and measured values for our performance measures. Some measures were determined in models (see Artifact —) and could not be empirically measured. As such, these values were placed in the predicted row, and N/A was assigned to the measured row.

Market Requirements	Performance Measures		Units	
	Importance			
1 Capable of flight for extended period of time	9	●	Battery life	Minutes
2 Capable of traveling an extended distance	9	●	Lift-to-drag ratio	Unitless
3 Minimize flight path deviation	9	●	Motor/prop efficiency	Unitless
4 Components are protected	9	●	Airframe weight	Kilograms
5 Complies with AMA safety code	9	●	Average flight speed	Meters/second
6 Capable of carrying UGV and water bottle	3	●	Stall speed	Meters/second
7 Fast and cheap rebuild	3	●	Spiral stability eigenvalue	Unitless
8 Looks decent	1	●	Static margin	Unitless
			Cn beta (yaw)	Unitless
			Cl beta (roll)	Unitless
			Number of components that fail off the plane	Unitless
			Number of damaged components on landing	Unitless
			Number of AMA safety code violations	Unitless
			Lift coefficient	Unitless
			Storage volume	Cubic centimeters
			Time to rebuild	Hours
			Focus group ease of repair	1-10 scale
			Focus group coolness rating	1-10 scale

  

Measured	Predicted	Target	Upper Acceptable	Ideal	Lower Acceptable
TBD	60	60	N/A	75	40
N/A	10	10	N/A	20	5
N/A	0.405	0.35	N/A	1	0.2
4.5	4.5	10	10	2	0
14.5	14	14	30	13	10
?	11	10	20	10	N/A
N/A	0.3187	0	0	-0.05	-0.1
0.075	0.06	0.1	0.15	0.1	0
N/A	0.10452	0.1	0.15	0.1	0.05
N/A	0.06032	0.1	0.1	-0.1	-0.15
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
N/A	0.5	0.5	1	0.5	0.35
10766	7974	8000	12000	10000	6000
8	10	10	24	0	N/A
6	8	8	10	10	5
?	8	8	10	10	5

Figure 1: The updated requirements matrix for the airframe subsystem, with section E included (target, predicted and measured values for performance measures.)