

Brigham Young University AUVSI Capstone Team (Team 45)

Airframe Subsystem Requirements Matrix

ID	Rev.	Date	Description	Author	Checked By
AF-001	0.1	10-23-18	Initial Draft	Tyler Critchfield	Derek Knowles
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AF-001	0.2	11-06-18	Concept De-	Tyler Critchfield	Ryan Anderson &
			velopment		Kameron Eves
AF-001	1.1	2-12-19	Subsystem En-	Tyler Critchfield	Ryan Anderson
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1 Introduction

Figure 1 (see next page) shows our updated Requirements Matrix for the Airframe subsystem. Section E has been updated with target, predicted, and measured values for our performance metrics. Some metrics were determined using models (see artifact AF-011), but could not be easily measured empirically. These metrics were placed in the predicted row and the measured value was assigned N/A.



	Units	Minutes	Unitless	Unitless	Kilograms	Meters/second	Meters/second	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Unitless	Cubic centimeters	Hours	1-10 scale
Product: UAS Subsystem: Airframe	Performance Measures	Battery life	Lift-to-drag ratio	Motor/prop efficiency	Airframe weight	Average flight speed	Stall speed	Spiral stability eigenvalue	Static margin (with payload)	Cn,beta (yaw)	Cl,beta (roll)	Number of components that fall off the plane Unitless	Number of damaged components on landing	Number of AMA safety code violations	Lift coefficient	Storage volume	Time to rebuild	Focus group ease of repair
Market Requirements	Importance	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Capable of flight for extended period of time	9																	Ш
2 Capable of traveling an extended distance	9	•	•	•	•	•												Ш
3 Minimize flight path deviation	9						•	•		•	•							Ш
4 Components are protected	9											•	•					\vdash
5 Complies with AMA safety code	9																	Н
6 Capable of carrying UGV and water bottle 7 Fast and cheap rebuild	3		•	•	•	•	•								•	•		
, , , , , , , , , , , , , , , , , , ,	Measured Predicted Target Upper Acceptable Ideal Lower Acceptable	40	2	0.2	0	10	N/A	-0.1	0	0.05	-0.15	0	0	0	0.35	0009	N/A	5
	Ideal	75	20	_	2	13	10	-0.05	0.1	0.1	-0.1	0	0	0	9.0	10000 6000	0	10
	Upper Acceptable	N/A	N/A	N/A	10	30	20	0.4	0.15	0.15	0.1	0	0	0	1	12000	24	10
	Target	09	7.5	0.35	4.5	41	10	0	0.1	0.1	0	0	0	0	2.0	8000	10	80
	Predicted	09	7.5	0.405	4.5	14	11	0.3187	90.0	0.10452	0.06032	0	0	0	0.7	7974	10	8
	Measured	50	5	N/A	4.5	14.5	11	N/A	0.057	N/A	N/A	0	0	0	2.0	10766	8	9

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