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 & Ryan Anderson	Derek Knowles
AF-001	0.2	11-06-18	Revisions for Final Submission	Tyler Critchfield	Ryan Anderson & Kameron Eves

			8	7	6	5	4	3	2	1			
			Looks decent	Fast and cheap rebuild	Capable of carrying UGV and water bottle	Complies with AMA safety code	Components are protected	Minimize flight path deviation	Capable of traveling an extended distance	Capable of flight for extended period of time	**Market Requirements**	Product: UAS Subsystem: Airframe	
Upper Acceptable	**Ideal**	**Lower Acceptable**	1	3	3	9	9	9	9	9	**Importance**	**Performance Measures**	**Units**
N/A	75	40							●	●	1	Battery life	Minutes
N/A	20	5			●				●	●	2	Lift-to-drag ratio	Unitless
1	1	0.2			●				●	●	3	Motor/prop efficiency	Unitless
50	4	0			●				●	●	4	Airframe weight	Kilograms
30	15	10			●				●		5	Average flight speed	Meters/second
20	10	N/A			●			●			6	Stall speed	Meters/second
-0.01	-0.05	-0.1						●			7	Spiral stability eigenvalue	Unitless
0.2	0.1	0						●			8	Static margin	Unitless
0.15	0.1	0.05						●			9	Cn,beta (yaw)	Unitless
0	-0.1	-0.15						●			10	Cl,beta (roll)	Unitless
0	0	0					●				11	Number of components that fall off the plane	Unitless
0	0	0		●			●				12	Number of damaged components on landing	Unitless
0	0	0				●					13	Number of AMA safety code violations	Unitless
1	0.5	0.4			●						14	Lift coefficient	Unitless
12000	10000	8000			●						15	Storage volume	Cubic centimeters
4	0	0		●							16	Time to rebuild	Hours
10	10	5		●							17	Focus group ease of repair	1-10 scale
10	10	5	●								18	Focus group coolness rating	1-10 scale

Figure 1: Airframe subsystem requirements matrix. Note that sometimes ideal values are unrealistic; rather, they are ideal. E.g., the ideal required build time is not time at all. Realism will be incorporated into target values in a future version of the Requirements Matrix.