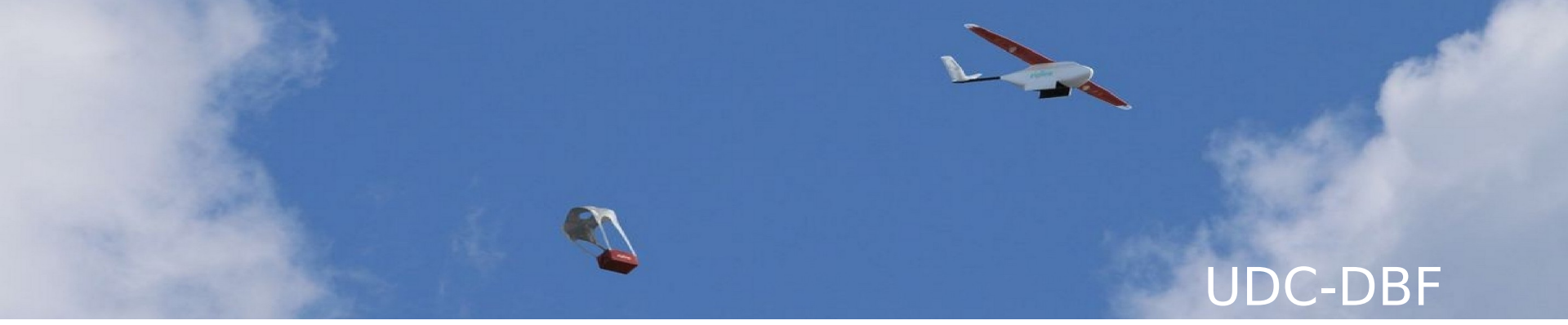

3rd Design Iteration

Team Name: **الثُّرَيّا**

Note: lengths should be in (cm), angles in (deg).

Wing Information	
Airfoil	NACA 6415
Span	152 (cm)
Root Chord	30 (cm)
Tip Chord	30 (cm)
Offset	40 (cm)
AR	5.07
S_w	4600 (cm^2)
Incidence Angle	0
Twist	0
Dihedral	2 (deg)
Vertical Tail Information	
Airfoil	NACA 0009
Semi Span (Total Length)	23 (cm)
Root Chord	20 (cm)
Tip Chord	18 (cm)
Offset	2 (cm)
S_v/S_w	0.087
AR_v	4.84
V_v	0.04288
Incidence Angle	0
Tail Arm	75 (cm)
Shifted Length in Z-Direction	-4 (cm)
Horizontal Tail Information	
Airfoil	NACA 0009
Span	64 (cm)
Root Chord	20 (cm)
Tip Chord	20 (cm)
Offset	0
S_H/S_w	0.283
AR_H	3.2
V_H	0.139
Incidence Angle	-1.5 (deg)
Tail Arm	75 (cm)
Shifted Length in Z-Direction	-4 (cm)

Propulsion System Information

Input					
Model Weight (Drive included or without)	2100g include drive				
Desired Flight speed	44.3 km/h				
Brushless Motor	Manufacturer	Model	Voltage Constant [KV]	No Load Current [A]	Resistance [ohm]
	ElectriFly	RimFire 0.15	1200	1.7	0.0415
Battery	Manufacturer	No. Of Cells	Voltage	Capacity [mAh]	C-Rating
	HRB	3	11.1	5200	50
Propeller Size (Diameter x Pitch)	10 x 4.7 in.				
Speed Controller (Current Rating Value)	60A				

Output	
Load	6.7 C
Mixed flight Time	10.5 min
Max. Current	33.43 A
Max. Power	383.4 W
Static Thrust	1618 g
Available Thrust [at the desired flight speed]	1151 g
Drive Weight	636 g
All Up Weight	2100 g
(Power/Weight) Ratio [Watt/lb]	85 W/lb - 187 W/kg
(Thrust/Weight) Ratio	0.77

Flight Phases

Phase 1 (payload isn’t deployed)	
MTOW	2.1 (Kg)
X_{CG}	10.9 (cm)
Static margin (%)	0.2
CL_{Cruise}	0.5932
V_{Stall}	690 (cm/s)
V_{Cruise}	1230 (cm/s)
α_{Trim}	1.5 (deg)
Required Static Thrust	788.997 (g)
Required Dynamic Thrust (at V_{Cruise})	170.81 (g)
Phase 2 (payload is deployed)	
Mass	1.6 (Kg)
X_{CG}	8.9 (cm)
Static margin (%)	0.2
CL_{Cruise}	0.4900
V_{Stall}	690 (cm/s)
V_{Cruise}	1220 (cm/s)
α_{Trim}	0.15 (deg)
Required Static Thrust	788.997 (g)
Required Dynamic Thrust (at V_{Cruise})	167.557 (g)