

Cargo UAV with serial hybrid propulsion

Aim is to develop and test UAV combining VTOL capacities with an exceptional low energetic consumption per kilometer flown thanks to its unique aerodynamic design. UAV will use serial hybrid propulsion system. AIRMOBIS designed fixed wing platform with VTOL capability. The main advantage of the platform is scalability. It can be modified (size; mtow) depending the output power of the propulsion.

Aircraft should be able to perform VTOL or "classical" take-off and landing with horizontal flight or any combination. Then whole architecture can be tested.

Advantage is, that the platform is SCALABLE. With current technologies it makes sense for us to adjust the platform (aircraft size and weight) to output power of combustion engine (as range extender). Then developed and tested. If successful, the whole concept can be Scaled Up.

		Small UAV (MTOW 40kg)	Bigger UAV (MTOW 200kg)
Combustion Engine	Requirements	10-15kW	40-50kW
		Proven track record – not necessarily in flight (i.e. motorcycle etc.)	Proven track record – not necessarily in flight (i.e. motorcycle etc.)
		Weight/power ratio above 2kW/kg	Weight/power ratio above 2kW/kg
	Possible partners	(Preferred one) A&M EDM Ltd (UK, NAAA) – 11kW rotary engine N47	(Preferred one) AUSTRO Engine – AE 50R Rotary Engine with EASA Part 22 Subpart H certification
		Advanced Innovative Engineering (UK, Birmingham)	https://www.austroengine.at/en/products
		https://www.aieuk.com/80s-15bhp-wankel-rotary-engine/	Turbotech (FR. Ile de France)
	Rotron (UK, Shaftesbury)	https://www.turbotech-aero.com/solutions/#turbogenerator	
	http://www.rotronuav.com/contact		
Power Generator	Requirements	10-15kW rated power (same power level as combustion engine)	40-50kW rated power (same power level as combustion engine)
	Possible partners	(Preferred one) Sullivan (USA, Baltimore) http://www.sullivanuv.com/product-item/s676-800u-03/	TBD
3 electric motors	Requirements	Weight/power ratio above 4kW/kg	Weight/power ratio above 4kW/kg
		2x – 2,5kW	2x – 9,5kW
		1x – 4kW	1x – 14kW
Possible partners	TBD	TBD	
Propeller	Requirements	1x two blade propeller (70-80 cm diameter)	1x two blade propeller (180 cm diameter)
		2x Can be multiblade (55-65 cm diameter)	2x Can be multiblade (150 cm diameter)
	Possible partners	Eprops (FR)	Eprops (FR)
		Duc Helice (FR)	Duc Helice (FR)
	Caltec (IT)	Caltec (IT)	
Same for both categories			
Autopilot (autonomous system)	Requirements	Beyond line of sight	
		Proven at least 1000 hours	
		Mission management system	
		To control 2 different propulsion systems	
		To control different flight modes – horizontal – VTOL and switch from one to another	
	FAA Group 3 (up to 600 MTOW) compatible (requirements for civil UAV)		
Possible partners	UAV Navigation (ES, Madrid) https://www.uavnavigation.com/		
Airframe	Requirements	TBD	
		Composite airframe	
		Done by 3D printing??	
	Can be modified to propulsion		
Possible partners	TBD		