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SONGBIRD – AN INNOVATIVE UAS COMBINING THE ADVANTAGES OF FIXED WING AND MULTI ROTOR UAS

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Abstract. This paper describes a family of innovative fixed wing UAS with can vertical take off and land – the SONGBIRD family. With nominal payloads starting from 0.5 kg they can take off and land safely like a multi-rotor UAV, removing the need for an airstrip for the critical phases of operation. A specially designed flight controller allows stable flight at every point of the transition phase between VTOL and fixed wing mode. Because of this smooth process with a all time stable flight, very expensive payload like hyperspectral sensors or advanced optical cameras can be used. Due to their design all airplanes of the SONGBIRD family have excellent horizontal flight properties, a maximum speed of over 110 km/h, good gliding properties and long flight times of up to 1 h. Missions were flown in wind speeds up to 18 m/s. At every time of the flight it is possible to interrupt the mission and hover over a point of interest for detail investigations. The complete flight, including take-off and landing can be performed by autopilot. Designed for daily use in professional environments, SONGBIRDS are built out of glass-fibre and carbon composites for a long service life. For safe operations comprehensive security features are implemented, for example redundant flight controllers and sensors, advanced power management system and mature fail safe procedures. The aircraft can be dismantled into small parts for transportation. SONGBIRDS are available for different payloads, from 500 g to 2 kg. The SONGBIRD family are interesting tools combining the advantages of multi-copter and fixed wing UAS.

[Conference paper](#) (PDF, 884 KB)

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