# UAVOS, KACST developing new Saker-1C MALE unmanned aircraft

**Date Posted:** 29-May-2020

**Author:** **Pat Host**, Washington, DC

**Publication:** Jane's International Defence Review

UAVOS and the King Abdulaziz City for Science and Technology (KACST) of Saudi Arabia are developing a new medium altitude long endurance (MALE) unmanned aerial vehicle, the Saker-1C, according to a company statement.

The Saker-1C can carry payloads ranging from synthetic aperture radar (SAR), imagery and coherent change detection, gyro-stabilised electro-optical/infrared (EO/IR) gimbal, and digital video datalink. The aircraft is designed to perform long-endurance surveillance, communications relay, and search and rescue missions, among others.

*UAVOS and the King Abdulaziz City for Science and Technology (KACST) of Saudi Arabia are developing the Saker-1C, a new medium altitude long endurance (MALE) unmanned aerial vehicle (UAV). (UAVOS)*

*1768087*

The Saker-1C has a 300 kg payload capacity, which is larger than found on the smaller Saker-1B. Aliaksei Stratsilatau, UAVOS CEO and lead designer, told *Janes* on 28 May that the company had to make many trades, mostly for safety, to accommodate this larger payload capacity. The tail was modified to aid mass distribution in the fuselage and an increase of inertial moments.

Advanced wing mechanisation, such as flaps, spoilers, and winglets, Stratsilatau said, was also implemented to support flight controls in different aircraft configurations and changes of payload weight. He said one of the Saker-1C's requirements is to be able to land fully-loaded, just after

take-off, in case of emergency.

UAVOS, thus, had to implement emergency fuel drain, improve landing gear capacity, and redesign many safety procedures to be approved to operate in airspace. The increased payload capacity, Stratsilatau said, also made an impact on the power distribution system, which was redesigned.

The new aircraft offers 30 hours maximum endurance due to a larger fuel capacity of 500 litres compared with the Saker-1B, and retrofitted long-endurance wings that span 18.7 m. The Saker-1C has a maximum altitude of 23,000 ft, a top speed of 110 kt, and a range of 3,840 km.

Stratsilatau said that the Saker-1C has improved engineering and operations features compared with the Saker-1B as it has adopted many parts from the civil aviation industry. These include landing gears, the brake system, and wings mechanisation, among others.

These, Stratsilatau said, simplify the future maintenance and overhaul of the aircraft as well as pre-flight inspections and checks. He said the Saker-1C has an improved wing shape and profile that is based on previous telemetry data and flight analysis acquired from previous Saker-1B test flights.

The Saker-1C has a fully-redundant control system and avionics, and an improved onboard satellite communication (satcom) system that provides an advanced direct link when flying within line of sight (LOS). This enables the aircraft to switch to a satellite link when flying beyond line of sight (BLOS) to transmit real-time information. Stratsilatau said UAVOS has proposals from several vendors for a new satcom system on the Saker-1C that will improve the aircraft's beyond visual line of sight (BVLOS) datalink stability, bandwidth, and power consumption. The Saker-1C, in addition to a high-speed satcom system, integrates a low-speed backup datalink for emergency use.

UAVOS used improved manufacturing techniques to develop a stronger body structure for the Saker-1C, allowing for easier maintenance without adding to weight. Stratsilatau said the Saker-1C's critical components, such as the wings, fuselage, and tail, were built according to processes used to build manned aircraft.

This, Stratsilatau said, dramatically improves the overall performance of the UAV, including its aerodynamic limits since its construction has improved the aircraft's strength and decreased its weight. The Saker-1C is also better able to sustain turbulence with increased manoeuvrability.

The Saker-1C features improved avionics compared with the Saker-1B. Stratsilatau said the better avionics include triple redundancy for the autopilot, twice as much payload power, advanced LOS communications systems with onboard tracking antennas, and improved power distribution capability. The Saker-1C has a company-developed computer vision-based landing assistance system that enables it to land autonomously on remote airfields.

The Saker-1C has an improved total energy control system (TECS) flight control algorithms to achieve better fuel efficiency with lower fuel consumption while allowing the aircraft to land safely in case of engine failure.

The aircraft's dry weight has been reduced to 600 kg using modern composite technologies. Stratsilatau said UAVOS and KACST launched a production line for manufacturing aircraft using composite materials and innovative technology based on carbon and infusion technologies.

Stratsilatau said the first Saker-1C flight is dependent on KACST and how Covid-19 plays out. The final preparations for the first flight, he said, would take roughly four months and include ground tests and airfield taxi tests.

**Comment**

UAVOS and KACST in March announced the Saker-1B, which resulted from a 10-year research and development (R&D) effort between the two stakeholders to develop a flight control system (FCS) designed for multimission, multi-domain UAV platforms. The Saker-1B can fly for more than 19 hours at an altitude of up to 16,500 ft with a range of 2,600 km.