# UAVOS, Stratodynamics HiDRON glider reaches 98,000 ft

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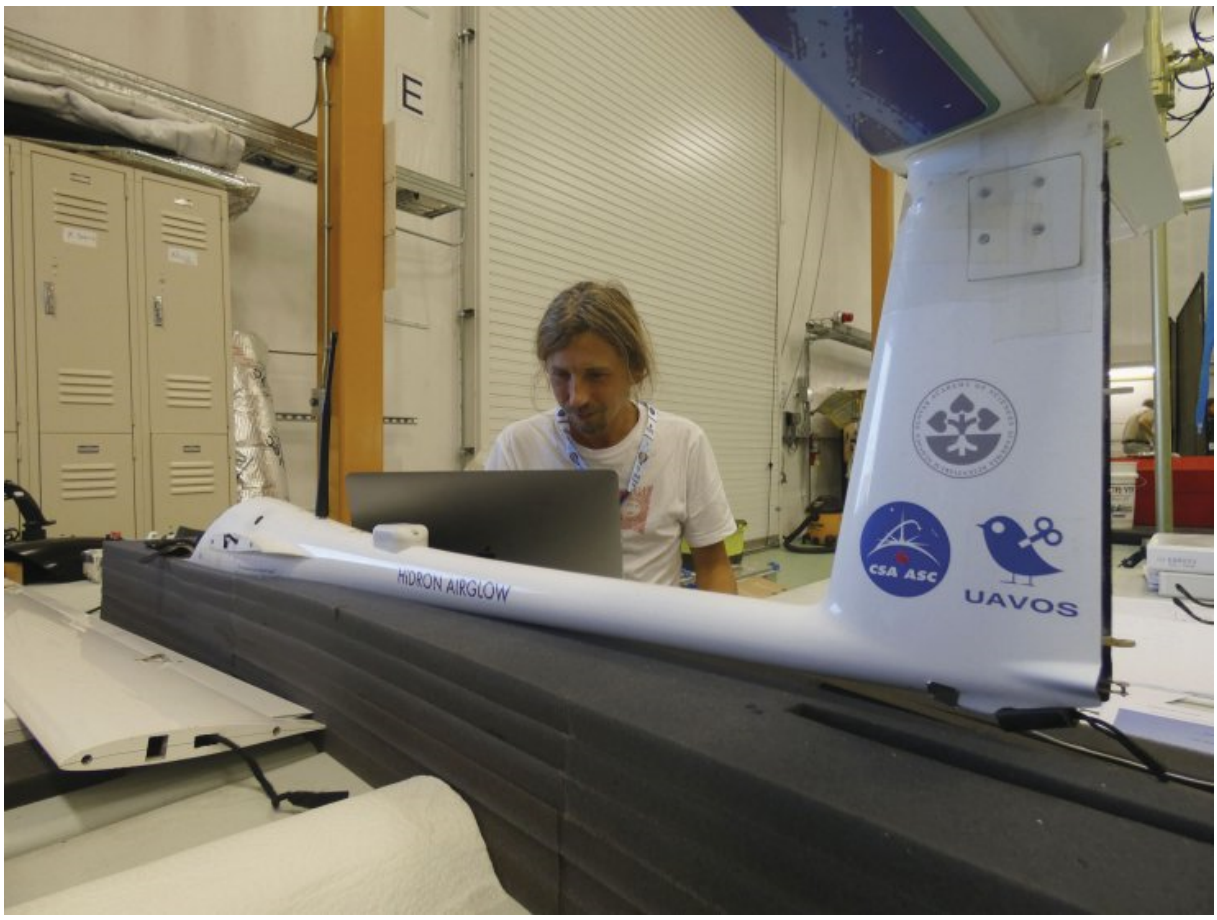
The UAVOS and Stratodynamics HiDRON stratospheric glider unmanned aerial vehicle (UAV) reached 98,450 ft altitude on 2 August, breaking the aircraft's previous record of 82,021 ft, according to a UAVOS statement.

The UAVOS ground crew lifted the HiDRON by a balloon to the 98,425 feet target altitude and released it in –60°C stratospheric conditions. The aircraft transmitted data in real time to the ground station during a four-hour controlled descent.

Aliaksei Stratsilatau, UAVOS CEO and lead developer, told *Jane's* on 9 September that the company was able to raise the HiDRON's altitude record by making improvements to the control algorithms and hardware. He said, specifically, that UAVOS integrated additional heaters for tail servo drives to make a new flight from a higher altitude possible. Stratsilatau said the regular weather balloon that lifted the HiDRON did not require any additional modifications to reach the higher altitude.




*UAVOS on 2 August lifted the HiDRON stratospheric glider UAV by a balloon to the 98,425 ft target altitude, a new record altitude for the aircraft. (UAVOS)*

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Stratsilatau said the HiDRON usually takes about 9,843 ft of altitude (free fall) to recover after it is dropped. The aircraft accelerates up to 200 m/s true airspeed (TAS) before the calibrated airspeed reaches the bottom line of stall speed and the control surfaces of the glider are able to provide enough forces for stabilisation in low-density stratospheric air. The total flight time, Stratsilatau said, from the release to landing, can be up to five hours, depending on the drop-off altitude and how fast the autopilot manages the aircraft's re-entry.

This flight, which took place in Belarus, was the first of two flights commissioned to test a new mini-Extreme Universe Science Observation (EUSO) AMON Airglow detector from the Slovak Academy of Sciences Institute of Experimental Physics. Gary Pundsack, Stratodynamics founder and CEO, told *Jane's* on 9 September that the AMON Airglow detector is a 500 g payload that measures a faint light emitted by the planetary atmosphere.

The AMON, Pundsack said, measures the night sky background in the near-ultraviolet spectral range. He said that the observation of the night sky background could be used to evaluate the high-energy phenomena from space that affect the airglow dynamics.

In addition to the AMON detector, UAVOS and Stratodynamics used the flight opportunity to test and advance aspects of the HiDRON design including stratospheric flight dynamics, data links, and UAVOS' autopilot.

UAVOS advanced these stratospheric flight dynamics, data links, and autopilot. Stratsilatau said the flight dynamics in the stratosphere is different from low-altitude flights. UAVOS, therefore, had to design additional control loops to maintain aircraft stability, in addition to the improved outer-loop gains, taking into account Reynolds numbers and high speeds, which can be up to 900 km/h in the re-entry phase.

Moreover, Stratsilatau said, UAVOS has designed special safety procedures such as autopilot and servo drives failures to be performed automatically in case of emergency. The HiDRON uses UAVOS' standard 900 MHz data link with an omni antenna onboard and hi-gain directional on the ground with an automatic antenna tracking system. Stratsilatau said this standard data-link solution is capable of providing a line-of-siteof up to 100 km. The autopilot hardware, he added, is from UAVOS' APX Micro product line with no modifications.

The HiDRON will be used for additional missions at new altitudes. Pundsack said in addition to pursuing new altitude records, UAVOS and Stratodynamics will pursue extending the flight duration more than 30,000 ft and increasing the flight range. Stratodynamics is also developing a series B HiDRON capable of carrying 5 kg payloads and will incorporate new design improvements.

**Comment**

The HiDRON is a high-altitude earth observation platform. Collected data can be used for in situ measurements or to validate ground- and satellite-based measurements. The aircraft can also be used to develop or test equipment prior to satellite deployment. It can also measure ozone.