AVIATION WEEK & SPACE TECHNOLOGY 100 YEARS 1916 - 2016

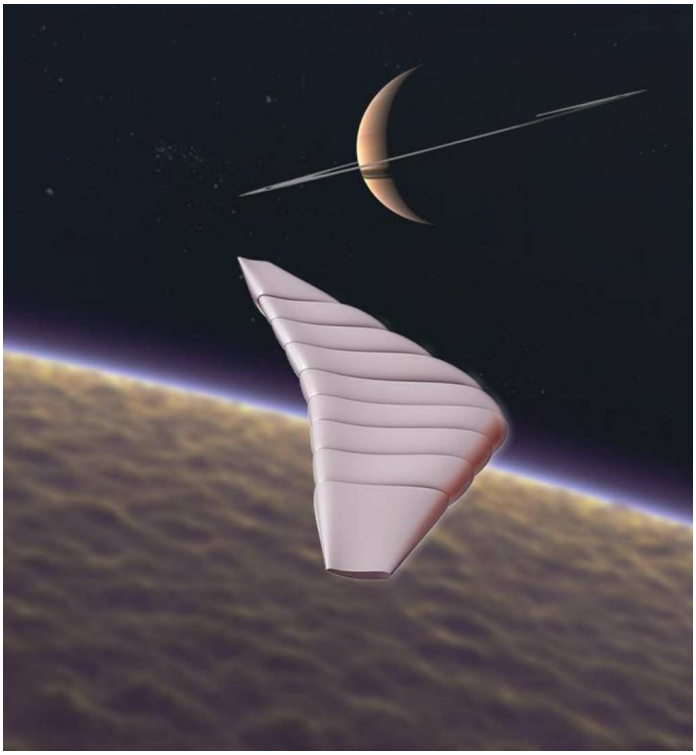
The Week In Technology, July 18-22, 2016

Graham Warwick | *Aviation Week & Space Technology* *Jul 18, 2016*

Winged Aerobot Could Explore Titan

Inflatable technology specialist Global Aerospace Corp. (GAC) and Northrop Grumman are to develop a buoyant vehicle to explore Titan, a moon of Saturn, under a NASA small-business research contract.

The team will develop the Titan Winged Aerobot (TWA) concept and produce a proof-of-concept vehicle for Earth-based testing. The design is inspired by Northrop's lifting entry/atmospheric flight (LEAF) concept for an inflatable vehicle that would drift down from space, avoiding the heat generated by a high-speed atmospheric entry, then operate as an atmospheric rover.



A buoyant, gliding rover would ascend and descend without power or control surfaces.
Credit: Global Aerospace Corp.

TWA is a hybrid entry vehicle, balloon and maneuverable glider with 3-D directional control, radioisotope power source, and a buoyancy system that enables both ascending and descending glide flight without a propulsion system or control surfaces, says GAC.

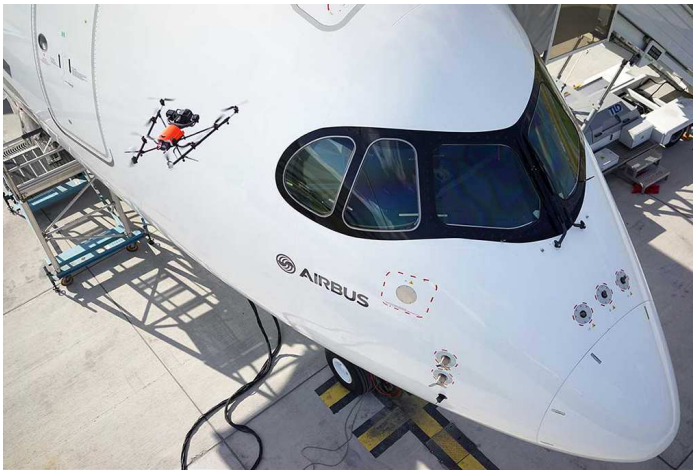
Roving the atmosphere will facilitate long-lived flight at low altitudes with revisit capability and possible targeted delivery of probes to the surface, “simple yet innovative engineering approaches to pressure management, lift generation and maneuverability” overcoming the challenges of Titan’s low temperature and low sunlight, the company says.

Northrop has previously studied versions of its LEAF semi-buoyant flying wing for missions to Mars, Venus and Titan, the latter called T-LEAF. “While the proposed effort is focused on developing and tailoring a vehicle for the Titan environment, the technology in TWA and T-LEAF is applicable on any solar system body with an atmosphere,” says GAC.

Airbus Checks Aircraft Quality by Drone

Airbus is testing the use of small unmanned aircraft to perform exterior quality inspections of airliners, to reduce the time required to find scratches, dents or painting defects by manual visual inspection.

The UAV, carrying a high-definition camera, follows a predetermined flightpath over the upper surface of the aircraft, flown by an automatic flight control system supervised by a human pilot.



In Airbus tests, a small unmanned aircraft is used to inspect aircraft exterior quality.
Credit: Airbus

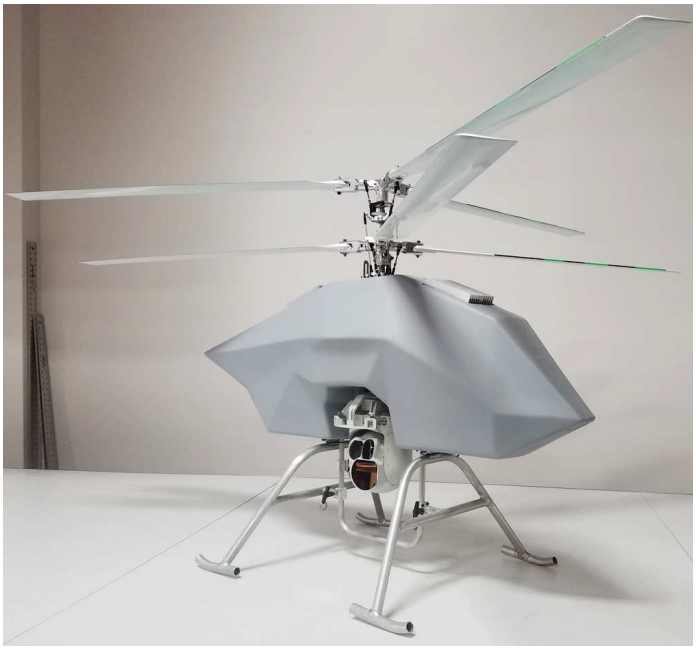
Images are collected automatically, compiled into a 3-D digital model and recorded in a database for analysis. This helps improve traceability, prevention and reduction of damage, says Airbus.

Data acquisition by drone takes 10-15 min. compared with 2 hr. for quality inspectors using a telescopic platform to access the aircraft, and improves both their safety and comfort, the company says.

A full-scale industrial test is being conducted on A330s, and Airbus says it is working on implementing UAV inspections on other programs. Low-cost carrier EasyJet is fielding drones at its maintenance bases to help detect aircraft damage from hail and lightning strikes.

Drone Aviation Corp. Unveils Bigger Tethered UAV

Drone Aviation Corp. has introduced a larger tethered unmanned aircraft, citing interest from military and security forces in a system that can lift heavier payloads to higher altitudes.



The tethered, coaxial-rotor Bolt can lift a 15-lb. gimballed payload to 800-ft. altitude.
Credit: Drone Aviation Corp.

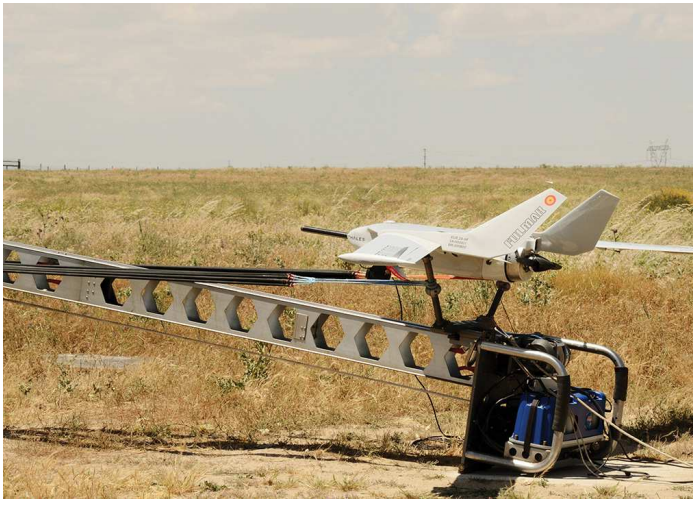
The Bolt is a small coaxial-rotor helicopter capable of lifting video surveillance or signals intelligence payloads weighing 15 lb. or less to 800-ft. altitude and staying aloft for at least 10 hr. on electric power supplied from the ground via the tether, which also carries the video and data signals.

The system can provide up to 1 kW of power to the payload. The tethered UAV has a "follow me" flight mode that allows it to be operated from a moving vehicle.

Jacksonville, Florida-based Drone Aviation is pitching the Bolt for roles including force protection, embassy security and convoy escort as well as border patrol, crowd management and search-and-rescue.

Fulmar X UAV Fits Confined Spaces

Thales has taken the wraps off its Fulmar X small unmanned aircraft system, which has been ordered by the Malaysian Maritime Enforcement Agency for operation from its Next General Patrol Craft beginning in 2017.



Flying-wing Fulmar X is designed for operation from confined spaces, such as ships.
Credit: Thales

With a 3.1-m (10.2-ft.) wingspan, the 20-kg (44-lb.) UAV is designed for operation from confined spaces, such as ships or vehicles, and is launched by catapult and recovered automatically by net. Payload capacity is 4 kg and endurance more than 8 hr., says Thales, which is offering the system for military and civil applications.

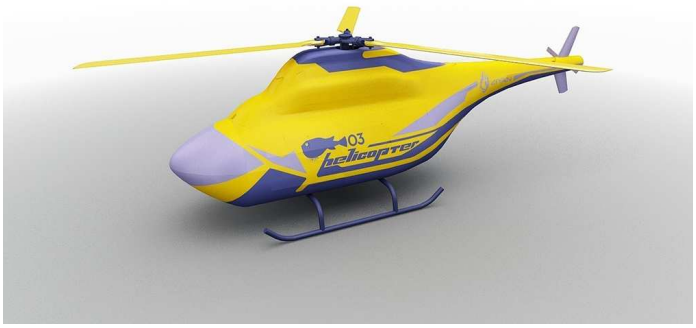
With a flying-wing airframe, carbon-fiber and Kevlar construction and an all-aluminum heavy-fuel engine, the Fulmar has been developed by Thales Spain. The UAV is equipped

with a stabilized electro-optical/infrared turret, but can be equipped with an automatic identification system ship-tracking sensor.

Helos Backed as Delivery Drones

Arguing quadcopters cannot meet the load, speed and safety requirements expected for commercial package delivery, Chinese manufacturer Ziyan UAV has unveiled plans for a range of small unmanned helicopters for aerial logistics.

Ziyan is working on three different sizes of unmanned aircraft—the ZYG-800, ZY-50 and ZY-280—with a conventional helicopter configuration with single main rotor and antitorque tail rotor. With a maximum takeoff weight of up to 40 kg (88 lb.), the ZYG-800 was introduced commercially in April.



Ziyan says small helicopters offer better load, speed, range and wind capabilities. Credit: Ziyan UAV

In addition to higher load capacity and speed capability than quadcopters in the same weight and power class, Ziyan says an unmanned helicopter can cope with higher wind conditions. Founder and CEO Jiangping Wang says flight testing so far has been conducted on the coast in strong and erratic sea breezes.

With a payload of 10 kg, the ZYG-800 has a cruise speed of 80-100 kph (50-60 mph), range of more than 30 km and endurance exceeding 30 min. on battery power. The ZY-50 has a maximum takeoff weight of 52 kg, while the ZY-500, which is still in development, will weigh more than 300 kg.

Wang says a next-generation flight control system with obstacle avoidance abilities is now under development. This includes a high-precision lidar sensor, infrared/visible-light camera and visual processing system to enable real-time target identification and tracking.

Discuss this Article 0

Related Articles

SpaceX Nails Falcon 9 First-Stage Landing 87

Pentagon Sees F-35 Having Air Superiority For 30 Years 184

The Week in Technology, Oct. 19-23, 2015 3

News In Brief, Day 2