

ACCIDENT

Aircraft Type and Registration:	Aerialtronics Altura Zenith ATX8 (UAS, registration n/a)	
No & Type of Engines:	8 electric motors	
Year of Manufacture:	2018 (s/n BSS149674003)	
Date & Time (UTC):	1 October 2019 at 0910 hrs	
Location:	Stoke Gifford, Gloucestershire	
Type of Flight:	Aerial Work	
Persons on Board:	Crew - N/A	Passengers - N/A
Injuries:	Crew - N/A	Passengers - N/A
Nature of Damage:	Airframe and gimbal destroyed beyond repair	
Commander's Licence:	N/A	
Commander's Age:	39 years	
Commander's Flying Experience:	466 hours (of which 42 were on type) Last 90 days - 33 hours Last 28 days - 5 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

Shortly after takeoff for a flight from a road bridge above two railway tracks, the UAS in GPS mode started to drift, accelerate and descend away from the pilot. The pilot was unable to regain control before it crashed into vegetation next to the tracks. A subsequent investigation by the operator found that magnetic deviations of up to 140° were observed over localised regions of the bridge below which the railway track's overhead high-voltage wires were being ducted.

History of the flight

Following pre-flight checks for a flight from a road bridge above two railway tracks, the UAS, in GPS mode, took off normally, but as it reached approximately 5 m above the ground it started to drift to the west. As it reached about 10 m it suddenly accelerated to the west and began to lose altitude. The pilot attempted to correct the drift, but the UAS continued to fly away where, out of sight of the pilot and operating crew, it crashed into vegetation next to the tracks.

Network Rail (Route Control and Air Operations) were immediately contacted to inform them of what had happened. They were subsequently contacted again a few minutes later once it was confirmed that the aircraft was not on the tracks. A Network Rail response team later recovered the damaged UAS.

Manufacturer's analysis of the flight log

The manufacturer analysed the flight log data and confirmed that the UAS was in GPS mode, and that the magnetic compass values had varied through about 60° within a couple of seconds of takeoff. It began to drift to the west and, at about 10 m above the ground, the compass stabilized to the correct heading, just as it accelerated and descended in a westerly direction. Although the pilot's corrective inputs were detected, the UAS (still in GPS mode) continued to move away and lose altitude. The whole flight lasted 13 seconds and covered a distance of about 100 m.

Operator's investigation and findings

Takeoff site inspection

The day after the accident flight, the operator went to inspect the takeoff site to try and identify any factors that might explain the aircraft's behaviour. A spectrum analysis of the radio frequencies at the site didn't identify anything of concern. However, when using a hand-held compass to check for any magnetic interference, deviations of up to 140° were observed over localised regions of the bridge below which the railway track's overhead high-voltage wires were being ducted.

Safety actions

As a result of the findings, the operator has made changes in its flying procedures to reduce the possibility of the event reoccurring. These include:

- (1) a magnetic interference check using a manual compass of an area 10 m around the planned takeoff location;
- (2) a visual check for objects and structures that might have a large magnetic field;
- (3) takeoff and landings should take place as far away from any sources of magnetic interference; and
- (4) the pilot should always be ready to switch out of GPS mode into atti(tude) or manual flight modes to retake control of the UAS if control is lost whilst in GPS mode.