

ACCIDENT

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|----------------------------------------|-----------------------------------------------------------------------------------------|------------------|
| Aircraft Type and Registration: | DJI Matrice 210 RTK (UAS, registration n/a) | |
| No & Type of Engines: | 4 electric motors | |
| Year of Manufacture: | 2018 (Serial no: ON4DEAQ0210210) | |
| Date & Time (UTC): | 18 July 2018 at 1147 hrs | |
| Location: | Farmer's field, Keith, Aberdeenshire | |
| Type of Flight: | Commercial Operation | |
| Persons on Board: | Crew - N/A | Passengers - N/A |
| Injuries: | Crew - N/A | Passengers - N/A |
| Nature of Damage: | Destroyed | |
| Commander's Licence: | N/A | |
| Commander's Age: | 42 years | |
| Commander's Flying Experience: | 20 hours (of which 18 were on type) Last 90 days - 0 hours Last 28 days - 0 hours | |
| Information Source: | Aircraft Accident Report Form submitted by the pilot | |

Synopsis

After about five minutes into the flight, a battery low voltage condition was detected by the UAS causing it to go into an automatic landing mode. Seventeen seconds later, while the aircraft was 25 m above the ground, it powered down and the electric motors stopped, causing it to fall to the ground. The batteries' State of Charge (SOC) was indicating that an erroneously high amount charge remained. The cause of the erroneously high SOC is discussed in the report on the accident to DJI Matrice 210 on 4 September 2018 (see EW/G2018/09/04, AAIB Bulletin 11/2019).

History of the flight

The DJI Matrice 210 RTK is a Matrice 210 Unmanned Aircraft System (UAS) using Real Time Kinematic (RTK) GPS correction technology to provide real-time corrections to its location data. It has a maximum takeoff mass of 6.14 kg. For the accident flight the takeoff mass was 4.57 kg.

The accident occurred on the fourth survey flight of the UAS that day. Each of the first three flights was no more than 20 minutes in duration and between each flight the batteries powering the aircraft were changed with fully charged ones. After about five minutes into the fourth flight, with the aircraft at a height of about 60 m, the pilot noted a battery low voltage message on the controller. Shortly afterwards, when the aircraft was above a farmer's field, its four electric motors simultaneously stopped, and it fell to the ground.

The damaged aircraft was sent to the manufacturer for repairs and analysis of the recorded onboard data. The AAIB was unable to obtain a copy of the recorded data (it had been deleted by the time it was requested); however, it did receive a copy of the manufacturer's analysis report. This stated that at 5.5 minutes into the flight, about 60 m agl, an automatic landing was triggered by an abnormally low battery voltage. Seventeen seconds later, about 25 m agl, data recording onboard the aircraft stopped.

Similar Matrice 210 UK accidents and investigation by the UAS manufacturer

During 2018, another three Matrice 210 accidents were reported to the AAIB, all of which had similarities with this accident and which the manufacturer concluded were a result of landings being initiated due to critically low battery voltages.

A comprehensive investigation, starting in October 2018, was undertaken by the UAS manufacturer. The findings and subsequent safety actions are detailed in the report on the accident a DJI Matrice 210 - EW/G2018/09/04 found in this AAIB Bulletin 11/2019.

See reports DJI Matrice 210 RTK - EW/G2018/10/09 and DJI Matrice 210 - EW/G2018/10/17 in this AAIB Bulletin 11/2019 for details of the other two accidents.