AAIB Bulletin: 1/2020	DJI Matrice 210	EW/G2018/10/23	
ACCIDENT			
Aircraft Type and Registration:	DJI Matrice 210 (UAS	DJI Matrice 210 (UAS, registration n/a)	
No & Type of Engines:	4 electric motors	4 electric motors	
Year of Manufacture:	2018 (Serial no: 0GC	2018 (Serial no: 0GODF680230091)	
Date & Time (UTC):	15 October 2018 at 1	15 October 2018 at 1245 hrs	
Location:	Merry Hill Shopping (Midlands	Merry Hill Shopping Centre, Brierley Hill, West Midlands	
Type of Flight:	Emergency services	Emergency services operations	
Persons on Board:	Crew - N/A	Passengers - N/A	
Injuries:	Crew - N/A	Passengers - N/A	
Nature of Damage:	Destroyed	Destroyed	
Commander's Licence:	Not applicable	Not applicable	
Commander's Age:	38 years	38 years	
Commander's Flying Experience:	6 hours (of which 6 w Last 90 days - n/k ho Last 28 days - n/k ho	6 hours (of which 6 were on type) Last 90 days - n/k hours Last 28 days - n/k hours	
Information Source:	Aircraft Accident Rep pilot and further enqu	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

Whilst hovering at a height of about 50 m over a building, one of the propeller motor electronic speed controllers failed, causing the aircraft to drop vertically and crash into the roof of the building.

History of the flight

The DJI Matrice 210 quadcopter small unmanned aircraft (SUA)¹, with a takeoff mass of 5.83 kg, was being used in support of an operation to target vehicle crime at a shopping centre. All flights were to be conducted over buildings to reduce risk to the public. It was reported that it was drizzling with a light wind. It was considered that the weather did not preclude flight as the aircraft had an IP43² rating.

The accident occurred during the second flight of the day. After takeoff the pilot checked the controls and the aircraft responded normally. After about 8 to 10 minutes of flight the

Footnote

¹ A SUA is defined by the Air Navigation Order (ANO) 2016 (Amendment 13 March 2019) as 'any unmanned aircraft, other than a balloon or a kite, having a mass of not more than 20 kg without its fuel, but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight.' This meaning includes traditional remotely controlled model aeroplanes, helicopters or gliders, as well as multirotor 'drones' and remotely controlled 'toy' aircraft.

² Refer to DJI Matrice 210 - EW/G2019/03/12 in this AAIB Bulletin 1/2020 for information on IP43 environmental protection.

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pilot brought the aircraft to a hover about 50 m above the roof of a shopping centre building. About one minute later, the aircraft suddenly dropped vertically and crashed into the roof of the building (Figure 1). The pilot had not made any control inputs and it was stated that there had been no warnings on the controller. The aircraft suffered severe damage (Figure 2).



Figure 1 Accident site location



Figure 2 Damage to the aircraft

Recorded information

The recorded data from the aircraft indicated that the batteries were functioning normally and there was 22.8 V and 65% charge remaining on both batteries when it had hit the building. The manufacturer reviewed the data and confirmed that the loss of power which led to a loss of lift and control was caused by failure of the No 4 (right front) motor electronic speed controller.

Refer to report on DJI Matrice 210 - EW/C2019/03/02 in this AAIB Bulletin 1/2020 for information on other accidents involving the DJI Matrice 210 and Safety Recommendations concerning the safe operation of a UAS near to people and congested areas.

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