ACCIDENT

Aircraft Type and Registration:	DJI Mavic 2 Pro	
No & Type of Engines:	4 DJI electric engines	
Year of Manufacture:	Unknown (Serial no: 163CJ1JR0A780V)	
Date & Time (UTC):	27 March 2023 at 1000 hrs	
Location:	Liverpool	
Type of Flight:	Private	
Persons on Board:	Crew - None	Passengers - None
Injuries:	Crew - N/A	Passengers - N/A
Nature of Damage:	Front left, rear left and rear right arm modules damaged and damage to the camera gimbal module	
Commander's Licence:	None	
Commander's Age:	28 years	
Commander's Flying Experience:	0 hours (of which 0 were on type) Last 90 days - 0 hours Last 28 days - 0 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

During a short flight the unmanned aircraft collided with a building. The pilot reported he inadvertently pressed the wrong control lever. He did not hold the necessary qualification to operate the aircraft. The operator has implemented new procedures to prevent recurrence.

History of the flight

The unmanned aircraft (UA) had been purchased by the university to assist with research. The university had registered as an 'operator' with the CAA.

On the day of the accident the aircraft was being flown by a research student. It was his first flight of any UA and he had not undertaken any training. He was intending to evaluate how the aircraft could be used to assist his research. He decided to fly it from the window of his living quarters on the third floor of the building, having confirmed there were no people in the vicinity. After approximately 3 minutes of flight, whilst the aircraft was maintaining 10 meters above the ground, the pilot attempted to increase its height. However, he believes he inadvertently pressed the forward/backward stick instead of the up/down stick. The aircraft moved towards the building, collided with the wall and fell to the ground. No one was injured but the aircraft was extensively damaged.

The pilot did not know what mode the UA was operating in when the accident occurred.

Aircraft examination

The aircraft and the flight logs were sent to the manufacturer for analysis. The manufacturer confirmed the aircraft was behaving normally until the moment of the accident and there was no evidence of any malfunction. It confirmed the aircraft was in 'positioning mode' when the accident occurred[1].

Aircraft information

The DJI Mavic 2 Pro is a quadcopter with a takeoff mass of 907 g. It is fitted with a gimbal mounted camera.

The UA has a vision system to detect obstacles and prevent collisions. However, it can only see obstacles within its detection range and the system requires sufficient lighting and sufficiently marked or textured obstacles. The vision system is not available in all flight modes.

Drone regulation

UK Regulation (EU) 2019/947 and its associated acceptable means of compliance and guidance material provides the regulation and policy in relation to the operation of UAS. CAA CAP 722 'Unmanned Aircraft System Operations in UK Airspace'[2] provides guidance to assist in compliance with the applicable regulatory requirements.

If the accident flight was operated in compliance with the regulation it would have come under the A2 subcategory. To operate in this category the pilot is required to obtain a Flyer ID and hold an A2 Certificate of Competency (A2 CofC). To obtain this certificate a pilot is required to undertake a theory course, pass an exam and certify they can safely fly specified manoeuvres.

Details of the requirements for UA pilots and operators can be found via the CAA's Drone and Model Aircraft Registration and Education Scheme found at https://register-drones.caa.co.uk/

Organisational information

Following the accident the university has reviewed its procedures for operating UAs and introduced the following guidelines:

- All UAs (irrespective of the category they are flown in) must be logged with the Safety Adviser's office. No flying is allowed if the UA is not logged.
- All UAs will have a nominated responsible person assigned to them.

Footnote

[1] The UA has three selectable modes (positioning, sport and tripod) plus a fourth mode (ATTI) which it can switch to automatically in certain circumstances. In positioning mode the UA utilises GPS and its vision system to locate itself, stabilise and navigate.

[2] CAA CAP 722 'Unmanned Aircraft System Operations in UK Airspace' available at https://publicapps.caa.co.uk/docs/33/CAP722_Edition_9.1%20(1).pdf (accessed 19 July 2023)

- All areas will need to introduce secure arrangements for the storage and access to the UAs.
- All pilots will complete the A2 CofC course.
- All pilots will attend the Safety Adviser's Office drones training session.

Conclusion

During flight the pilot inadvertently pressed the forward/backward lever causing the UA to collide with a building. The investigation did not determine why the UA's vision system did not detect the obstacle. The pilot had not undertaken any training and did not hold the required qualification to operate the aircraft.

The university has implemented procedures to ensure appropriate control of UAs and to ensure all pilots have completed the appropriate training, registration, and qualifications.