

ACCIDENT

Aircraft Type and Registration:	Parrot Anafi USA	
No & Type of Engines:	4 electric motors	
Year of Manufacture:	2020	
Date & Time (UTC):	3 April 2021 at 2337 hrs	
Location:	Quarry Span Hill, Henley on Thames, Oxfordshire	
Type of Flight:	Commercial Operations (UAS)	
Persons on Board:	Crew - None	Passengers - None
Injuries:	Crew - N/A	Passengers - N/A
Nature of Damage:	None	
Commander's Licence:	Other	
Commander's Age:	49 years	
Commander's Flying Experience:	3 hours (of which 1 was on type) Last 90 days - 1.5 hour Last 28 days - 0.5 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further AAIB enquiries	

Synopsis

While conducting a flight in support of police search operations, the pilot became concerned about losing visual line of sight with the unmanned aircraft (UA) and attempted to activate the return-to-home (RTH) function. The UA had not acquired a GPS signal prior to the flight and therefore did not record its takeoff point, rendering the RTH function ineffective. The UA lost connection with the controller and drifted in the wind. It was located undamaged the next day approximately 5 km away, having performed an automatic landing.

History of the flight

The Parrot Anafi USA¹ was being operated at night above a quarry in a rural area, in support of police search operations. The pilot reported that he completed pre-flight checks and checked the weather forecast before the flight. He reported the actual weather conditions as a light easterly wind, visibility of more than 1 km, scattered cloud and a temperature of 3 to 4 °C.

The pilot reported that following a normal takeoff, he climbed the UA to 40 m above ground level at the edge of the quarry, before gradually positioning it over the quarry in the hover, approximately 120 m away from the takeoff point. He became aware of the presence of

Footnote

¹ The Parrot Anafi USA is a small Class C1 UAS with a maximum takeoff weight of 501 grams.

mist in the area where the UA was operating and stated that the blue LED visibility light on the UA was becoming harder to see. As he was uncertain of the orientation of the UA, he activated the RTH function but the aircraft did not fly towards the takeoff point as he expected. He recalled that he pressed RTH once again to cancel the command, but the UA continued to fly in a northerly direction until it was out of sight and the screen of the controller went black.

The UA was found undamaged the next day in a playground approximately 5 km north of the takeoff point.

Personnel

The pilot had completed a five day basic General Visual Line of Sight Certificate (GVC) course with a commercial training organisation in September 2020, accruing 2 hours flight time on a DJI Mavic UAS. He did not fly again until February 2021, when he undertook a 33 minute training flight on the Parrot Anafi USA and assessment with an instructor, during which he was assessed to have demonstrated operational flying competency to a safe standard. He undertook a further two operational flights in February and a self-training flight in March. At the time of the accident, he had approximately 3.5 total flight hours, of which approximately 1.5 were on the Parrot Anafi USA.

Recorded information

The UAS manufacturer provided the following information after analysing the log file from the accident flight. The flight commenced 37 seconds after the UAS was switched on; the battery state of charge was 99 %. The UA did not acquire a GPS signal at any point prior to or during the flight. The UA was flown to approximately 100 m barometric altitude. The RTH function was first selected after three minutes and 53 seconds of flight. It was then selected a further four times. The UA lost connection after five minutes and 53 seconds of flight.

The UAS manufacturer indicated that the smartphone device used to control the Anafi would have received alerts via the Parrot FreeFlight 6 application advising of no GPS signal. The manufacturer indicated that in the absence of GPS, it would expect that the UA is either not flown or flown with extreme caution. As the UA did not acquire a GPS signal, it would not have recorded the takeoff position, rendering the RTH function ineffective. After losing connection, the UA was carried by the wind.

Organisational information

The CAA does not specify a minimum time for UAS pilot currency. In common with other UK police forces, the operator's own currency requirements stipulate a minimum of 2 hours flying within a rolling 90 day period. Its operations manual indicates that this can consist of training or operational flights. If a pilot falls below the currency requirement, a requalification flight assessment is required with the chief pilot/instructor. If a period of inactivity occurs, defined as fewer than two flights in the previous month or no flights in the previous two months, a pilot must undertake a flight assessment with the chief pilot/instructor before operational flying.

Following the accident, the operator proposed a period of re-training and re-assessment for the pilot to include: five hours one-to-one flight training with an instructor; one month of coaching/ shadowing with another competent UA pilot; flight assessment by an independent assessor from another police force; a three month review period; and submission of a 'human factors reflective practice report regarding omissions and learning'.

Discussion

Although, the RTH function did not operate as the pilot expected, the UA was still capable of responding to manual control inputs, although none were recorded after the initial attempt to activate the RTH function. It is not known whether the presence of mist cause the pilot's visual line of sight with the UA to be degraded or lost entirely. However, the pilot subsequently had visual contact with the UA as it drifted to the north and there may have been an opportunity at this point to manually fly the aircraft back to the takeoff point.

Following his initial training in September 2020, the pilot's currency had lapsed and in accordance with the operator's procedures, he undertook a training and assessment flight in February 2021 to re-establish flying currency. He then carried out two further operational flights in February and one self-training flight in March. Having completed only one flight in the month preceding the accident flight, this would meet the operator's definition of a 'period of inactivity', requiring the pilot to undertake a flight assessment with the chief pilot/instructor before further operational flying. It is not clear whether this requirement was monitored at an individual or organisational level.

It is notable that the period of re-training and re-assessment for the pilot proposed by the operator following the accident, is substantially longer and more involved than the operator requires for its pilots to achieve initial competence.

Conclusion

The loss of control and subsequent flyaway occurred when the RTH function did not operate as the pilot expected. The RTH function was rendered ineffective because the flight was commenced prior to the acquisition of a GPS signal.

Safety actions

Following the accident, the operator amended its In-Flight Checklist to include an action to confirm the home point is locked, and if time permits, to check the RTH function. It also intends to fit additional LED lighting to its UAs, to assist in maintaining line of sight at night.