

ACCIDENT

Aircraft Type and Registration:	Cessna T206H Turbo Stationair, G-KIKX
No & Type of Engines:	1 Lycoming TIO-540-AJ1A piston engine
Year of Manufacture:	2001 (Serial no T20608267)
Date & Time (UTC):	12 March 2012 at 1838 hrs
Location:	Challock, near Ashford, Kent
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Minor) Passengers - N/A
Nature of Damage:	Extensive damage to front fuselage and engine
Commander's Licence:	Commercial Pilot's Licence
Commander's Age:	48 years
Commander's Flying Experience:	903 hours (of which 1 was on type) Last 90 days - 43 hours Last 28 days - 26 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by AAIB

Synopsis

The pilot descended his aircraft below the safety altitude in failing light conditions and poor visibility. He was relying upon navigation data from a GPS unit, but had inadvertently programmed an erroneous destination into it. The GPS steering commands took the aircraft over higher terrain and, as the pilot applied power to arrest the descent, the aircraft struck the ground at an elevation of about 580 ft amsl, without the pilot gaining external references. Although the aircraft was substantially damaged, the pilot survived with minor injuries.

History of the flight

The pilot had been ask to go from his home airfield at Lashenden (Headcorn) in Kent to Tilstock Airfield in

Shropshire, in order to collect G-KIKX and fly it back to Headcorn. Although he was involved in the decision about which day the flight should be made and had agreed to it, it was to be the pilot's seventh working day and was originally intended to be a day off.

The pilot caught a train to Shropshire at 0735 hrs and arrived at around 1320 hrs. He was not familiar with the aircraft and, when he examined its documents on arrival he found them incomplete. A delay was, therefore, incurred whilst the matter was resolved to the pilot's satisfaction.

The pilot completed his preliminary checks on the aircraft and noted that the fuel load of about 30 US gallons was less than he would require. He was

told he would be unable to obtain fuel at Tilstock but that he could refuel at Sleaf Airfield (about 7.5 nm away). The pilot also noted that the GPS navigation unit had a defective screen in the area of the waypoint data entry field, which effectively obscured the first character, a defect which had been drawn to his attention during earlier type training. The pilot observed that great care had to be taken when entering waypoint data and that it was not possible to guarantee the accuracy of the entry by reference to the data field alone.

The pilot departed Tilstock some time before 1700 hrs for the short flight to Sleaf. There, the aircraft was fuelled to full and the pilot took the opportunity to telephone his manager at Headcorn to check the weather. He was told that the weather was workable but that there was a bank of cloud to the east. The manager was not on the airfield at the time and advised the pilot to call the control tower at Headcorn for an accurate report. It was reported that no such call was received. Staff recalled that the airfield was under low overcast cloud that afternoon, although some circuit flying did take place up until 1657 hrs. From METAR and TAF reports, the pilot did not expect to encounter significant cloud as far as Gatwick Airport.

The pilot reported departing from Sleaf for the VFR flight to Headcorn at 1710 hrs (although reports from Sleaf put the time closer to 1720 hrs). The route described by the pilot was a minimum of 172 nm long. With sunset occurring at 1757 hrs, the landing was thus to be expected in twilight or at night, although the runway at Headcorn was not lit.

The flight for the majority of the route was uneventful and the pilot spoke to London ATC to obtain latest weather reports. The actual en-route weather was better than expected until reaching North Kent, by which time daylight was fading. The pilot had earlier confirmed his

position over the Lamborne VOR/DME by joint use of the GPS and his VOR equipment. He then set the GPS to give direct navigation to Headcorn (entering, he thought, ICAO code 'EGKH') and noted that the resulting track and distance appeared correct.

The aircraft encountered increasing cloud until it was flying above an overcast layer. With an indicated 7 nm to run to the GPS destination, the pilot commenced a descent through cloud, aiming to fly not lower than 600 ft altitude (Headcorn Airfield is at an elevation of 72 ft amsl). In fact, he allowed the descent to continue slightly below 600 ft and, as he applied power, the aircraft struck terrain. The engine stopped abruptly and the aircraft pitched nose-down, sliding on its main wheels and forward fuselage for a short distance, before coming to rest.

The pilot, who was only slightly injured, vacated the aircraft quickly and telephoned the police, giving his position as north-west of Headcorn. He then returned to the aircraft to make it safe and await the police. When help had not arrived after about an hour, he re-powered the GPS and entered EGKH as the destination. This gave his position as about 8 nm north-east of Headcorn Airfield, not north-west as he reported to police.

The aircraft had crashed on a relatively flat piece of terrain, at an elevation of about 580 ft amsl. Its position was just a few hundred metres from Challock gliding site, elevation 600 ft amsl, with the ICAO identification EGKE. (The safety altitude in the area was 2,400 ft, based on a mast up to 1310 ft elevation, 16.5 nm north-west of Headcorn).

Pilot's assessment of the cause of the accident

In his report, the pilot identified a number of significant events and situations leading up to the accident. It had occurred at the end of a relatively stressful day

which itself came at the end of a long working week. He therefore considered that fatigue had played a part. Although the pilot was aware that the weather and late departure presented a potential problem, he had not identified a suitable alternate airfield in case landing at the unlit Headcorn Airfield was not possible. As the aircraft neared Headcorn and encountered deteriorating weather and rapidly failing light conditions, pressure to complete the flight increased and resulted in poor decision making.

Finally, the pilot had relied on the GPS for position information for his let-down through cloud. When he subsequently reviewed the events of the day, he thought it likely that he had made a GPS input error, through a combination of equipment deficiency, fatigue and time pressure, and that he had erroneously selected Challock gliding site as the desired GPS destination waypoint instead of Headcorn.

Search and Rescue activity

At 1838 hrs the Distress and Diversion Cell at London Air Traffic Control Centre (Military) received signals from the aircraft's emergency locator beacon through a receiver near Ashford in Kent. The appropriate search and rescue authorities were notified, although the origin of the signals was unknown at that stage. It was subsequently established that the pilot had been in contact with Kent police, but as he was unsure of his position, the police requested assistance to trace the aircraft. A replay of recorded radar identified the aircraft, which was tracked to a position about 7.5 nm north-east of Headcorn, heading south-east towards Ashford. At 2120 hrs, Kent police advised that the aircraft and pilot had been located.

Further enquiries

Further information, provided to the AAIB by other personnel connected with the aircraft, indicated that it had been made clear during a demonstration flight and required differences training, prior to the ferry flight, that the GPS unit, in which the navigation database had expired, was not useable and, if required, pilots should use a portable GPS unit.

Publications

In its Introduction, the CAA's General Aviation Safety Sense Leaflet 25, entitled *Use of GPS*, states:

'Unless specifically approved for particular purposes, such [GPS] equipment is only to be used as an aid to other forms of navigation.'

Elsewhere, it also states:

*'The GPS system has generally shown exceptional reliability, but it has been known to suffer technical and human failure. Consequently, **GPS must not be relied upon as a sole navigation reference in flight-critical applications.** Common sense dictates that pilots should not only familiarise themselves with the techniques required to use the system properly, but understand how it could go wrong and prepare for the unexpected.'*

AAIB comment

The pilot's report identified a number of links in this accident 'chain', any one of which could have been 'broken' to avert the accident or make it less likely. These included the initial planning of the flight, the lack of preparedness of the aircraft for flight, the acceptance of the aircraft, inadequate flight planning and the late departure.

The pilot could have delayed the flight to the following day. In the event, he embarked on the flight in an unfamiliar aircraft, in weather that was less than ideal, with an ETA after dark at an unlit airfield, without a planned alternate destination and in a fatigued state.

The pilot thus placed himself under mounting pressure as the flight progressed, culminating in a descent significantly below the safety altitude, without visual references, using the GPS as the prime means of

navigation. It is likely that the pilot inadvertently selected EGKE (Challock) as the destination, instead of EGKH (Headcorn), resulting in a track which took the aircraft over much higher terrain than the pilot realised. Because the two airfields were so close, the track and distance generated by the GPS were not grossly in error and were therefore less likely, without thorough pre-flight preparation and good positional awareness, to have been noticed. Nevertheless, the decision to descend was the primary cause of the accident.