ACCIDENT

Aircraft Type and Registration:	Cessna T303 Crusader, N289CW	
No & Type of Engines:	2 Continental Motors Corp IO-520-AE piston engines	
Year of Manufacture:	1982 (Serial no: T30300032)	
Date & Time (UTC):	4 September 2013 at 0913 hrs	
Location:	Approximately 5 nm from Jersey Airport, Channel Islands	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Fatal)	Passengers - 1 (Fatal)
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	FAA Private Pilot's Licence	
Commander's Age:	56	
Commander's Flying Experience:	524 hours (of which 319 were on type)[1] Last 90 days - Not known Last 28 days - Not known	
Information Source:	AAIB Field Investigation	

Synopsis

The aircraft was on a VFR flight from Dinan, France, to Jersey, Channel Islands and had joined the circuit on right base for Runway 09 at Jersey Airport. The aircraft turned onto the runway heading and was slightly left of the runway centreline. It commenced a descent and a left turn, with the descent continuing to 100 ft. The pilot made a short radio transmission during the turn and then the aircraft's altitude increased rapidly to 600 ft before it descended and disappeared from the radar. The aircraft probably stalled in the final pull-up manoeuvre, leading to loss of control and impact with the sea, fatally injuring those on board.

History of the flight

The pilot had asked a Jersey based maintenance organisation to facilitate a repair of N289CW's autopilot. The pilot and his passenger intended to fly N289CW to Jersey and onward to France for a short holiday, after which they were to return to Jersey for the maintenance to be carried out.

They departed East Midlands Airport on 30 August 2013 and flew to Jersey Airport. The aircraft was refuelled to full tanks and flown to La Rochelle later that afternoon. The pilot and passenger then spent some time in La Rochelle before flying N289CW to Dinan Airport

Footnote

[1] The pilot's log book was not found and the flying hours shown are from a recent Certificate of Insurance.

on 2 September 2013. The pilot and passenger stayed in the local area before departing for Jersey Airport early on 4 September 2013.

The aircraft was first identified on Jersey radar at 0846 hrs, whilst over northern France and at a corrected altitude[2] of 2,600 ft. The following narrative is a description of events derived from radar and radio transmissions. At 0907 hrs, Jersey Approach gave the aircraft a radar control service as it entered controlled airspace and referenced information Quebec. The pilot was cleared to enter the Jersey control zone at an altitude not above 2,000 ft in order to remain clear of Class A airspace above that altitude. It is not known what navigation aids the pilot was using for the flight. At 0909:37 hrs the pilot was asked to report when visual and his response included a need to descend due to clouds. At 0909:52 hrs he was handed over to the Jersey tower frequency. The aircraft descended to between 1,300 ft and 1,500 ft as it tracked towards Runway 09 and the groundspeed was calculated at approximately 150 kt during that time. At 3 nm from the extended centreline, the aircraft commenced a descent to 1,100 ft before making a right turn onto final approach.

The aircraft passed through the extended centreline of Runway 09 at 0911 hrs at an altitude of 600 ft and continued to descend to 100 ft. At this point the aircraft was about 4 nm from the runway threshold and slightly left of the centreline. The aircraft then commenced a left turn during which the pilot transmitted to Jersey tower "ERM SORRY MAAM CAN YOU GIVE ME THE FREQUEN … SORRY I'VE DONE … COMPLETELY GONE WRONG WAY ROUND THERE JUST EH … ONE MOMENT." The aircraft continued in the turn at 100 ft and the groundspeed decayed from 150 kt to 100 kt. After turning through 180°, the aircraft entered a rapid climb to 600 ft at a minimum rate of climb of 4,000 fpm. It then descended, at a similar rate of 4,000 fpm, to below the coverage of the radar.

Subsequently, floating debris was found on the sea and it was confirmed this was from N289CW and that the pilot and passenger had suffered fatal injuries.

Pilot's Information Manual

The aircraft's weight was estimated at 4,642 lbs with a forward CG which according to the Pilot's Information Manual gave corresponding stall speeds of 55 kt with FULL flap set, 57 kt with 10° of flap and 63 kt with flaps UP.

The manual also states that:

> *'Altitude loss during a conventional stall recovery may be 650 ft'.*

Footnote

[2] The corrected altitude was calculated from the transponder derived Mode C altitude, corrected for the aerodrome QNH of 1021 hPa.

Weather

On the morning of the accident, Jersey Airport had been experiencing fog. This had later cleared at the airport but was extensive over the surrounding sea area and was estimated to be from the surface to a height of 500 ft. The pilot of a Trislander aircraft, which was on an IFR transit from Guernsey to Jersey at 2,000 ft, had been VMC on top of the fog with a clearly defined horizon and could see the runway and Island of Jersey. He reported that the Island was surrounded by fog with some still obscuring the most northern parts of the island. The Trislander had descended to 1,500 ft and carried out an ILS approach to Runway 09 at Jersey, and the pilot reported that the runway was clearly visible throughout the approach and landing.

It is not known what weather information the pilot of N289CW accessed prior to the flight, but the Airfield Terminal Information System (ATIS) was available and provided the following information:

> *'Information Quebec at 0850 hrs, runway in use 09, surface wind variable at 03 kt, visibility 6km, fog in the vicinity, no significant weather, temperature 19, dew point 16, QNH 1021 hPa, QFE 1011 hPa, no significant change.'*

A CCTV video recording, from a camera located at a commercial property and pointing south-west, was of moderate quality but showed fog over the sea in the proximity of the runway threshold.

A lifeboat crewmember who attended the scene shortly after the accident noted that there was fog down to the surface approaching the area of the accident and near the floating wreckage.

Aerodrome information

Jersey Airport has a single runway orientated 09/27. It is located on the western side of the Island of Jersey with the threshold for Runway 09 located 0.7 nm from the coast to the west. The runway is 1,706 m long by 46 m wide and has an asphalt/concrete surface. The Landing Distance Available (LDA) for Runway 09 is 1,645 m and the threshold elevation is 270 ft. Runway lighting comprises a High Intensity Approach Lighting System (HIALS), Runway End Identification Lighting (REIL), Runway Edge Lighting (REL) and Centreline Lighting (CL) with Precision Approach Path Indicators (PAPIs) set to an approach angle of 3º.

Radio communication is available on Zone, Approach, Tower and Ground frequencies with an Airfield Terminal Information System (ATIS) on frequency 134.675 MHz. Navigation is provided by an Non-Directional Beacon (NDB) radiating on frequency 329 kHz and Runway 09 is equipped with an Instrument Landing System on frequency 110.9 MHz, which is frequency paired with Distance Measuring Equipment (DME) and indicates zero at the 52 m displaced threshold.

Recorded data

No onboard recordings were recovered. Radar returns from the Les Platons radar head in the north of Jersey, Jersey Airport radar and Guernsey Airport radar, along with radio transmissions were recorded by Jersey ATC and analysed. The Les Platons and Jersey Airport radar provided secondary radar that included encoded altitude. The coastguard radar also recorded a partial track but offered no additional information.

The radar recordings commence at 0846:56 hrs shortly after departure from Dinan and continue until the aircraft descended below the coverage of the radar at 0912:40 hrs. The recorded radar track is shown in Figures 1 and 2.

The speed is the radar ground speed derived from the point-to-point distance between radar returns. The initial erratic behaviour of the ground speed was due to the position inaccuracy of the radar before the aircraft had gained altitude, whilst it was over France. This also occurred at the end of the track, as the aircraft was at the limit of radar coverage and because of terrain obscuration, therefore the speed calculations are indicative of aircraft speed trends rather than absolute speed values.

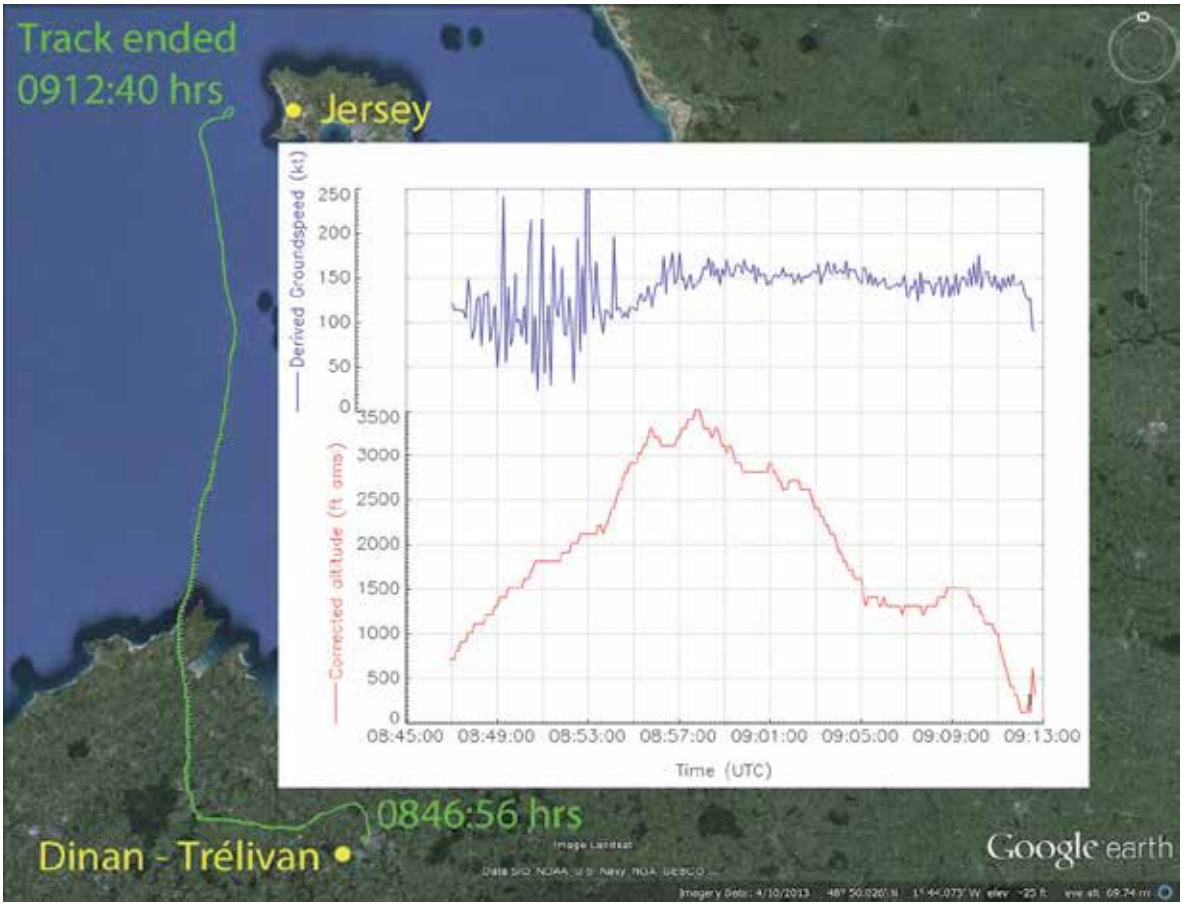

Figure 1
Recorded flight

The altitude values are encoded by the aircraft systems with a 100 ft resolution, and have been corrected for the ambient air pressure at the time.

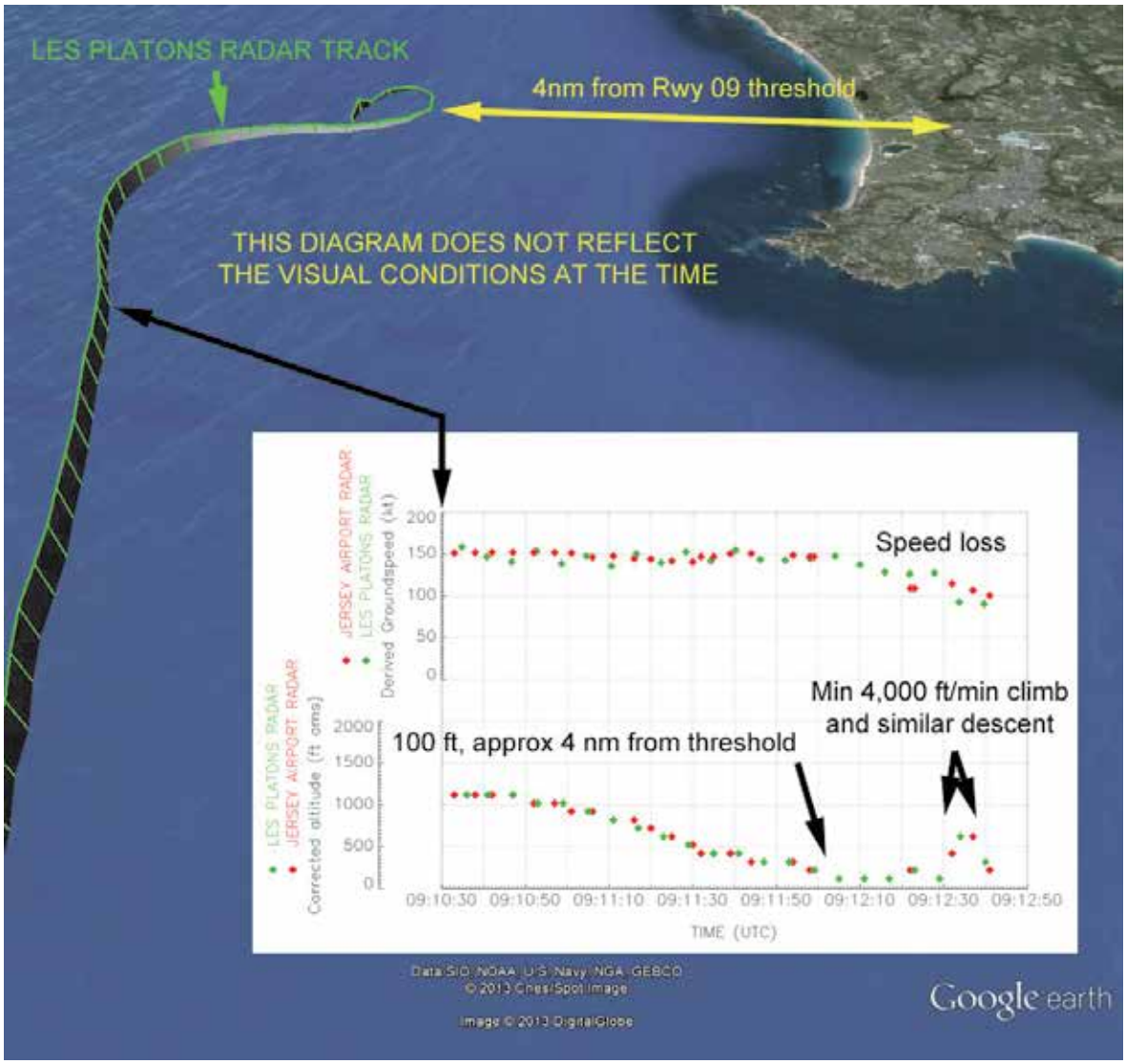

Figure 2
End of radar track

Aircraft description

N289CW was a Cessna T303 Crusader, an all-metal twin-engine monoplane fitted with retractable tricycle landing gear, an autopilot and a weather radar. It was designed for general utility purposes and could carry six persons including the pilot. The aircraft was built in 1982 and registered in France. It was transferred from the French register onto the US register in 2007. Preparation for transfer and certification was carried out by a FAA authorised UK based company. At this time the aircraft had completed 5,717 flying hours. In the absence of a current journey log, the aircraft is estimated to have accumulated 6,000 flying hours at the time of the accident.

Wreckage

After being notified of the accident, the Jersey Coastguard initiated a rapid response and sent a number of vessels to the area estimated from the last radar return. Floating debris, consisting of lightweight plastic, wooden and fabric items and personal effects, was subsequently recovered from the sea.

Further searches, including the use of side scan sonar, centred on the estimated position of the aircraft, found no further remains of the aircraft on the surface or on the seabed. It was probable that the tidal currents in the locality were highly dispersive on any floating and submerged wreckage.

All the identifiable items from the aircraft had originated from the nose bay or cabin of the aircraft with the exception of two similar aluminium honeycomb section panels. Both of these panels were from the left and right upper main plane surfaces between the engine nacelles and the fuselage situated above the mainwheel bays. These sections were distorted and bowed outwards. The forward edges of the panels, where they had been attached to the mainplane leading edges, had uniform 'concertina' crumpling along their entire length. The double row rivet holes on all sides were distorted and demonstrated an overload in tension and shear of the rivets.

The plastic aircraft cabin trim items, including the instrument panel combing, were fragmented, cracked and distorted. There were also small amounts of soft furnishings including three seat headrests, the co-pilot side map pocket and the remains of the small wooden pullout passenger table. The only part of a cockpit instrument recovered was a small black plastic knob with a steel shaft from the co-pilot (P2) attitude indicator.

From the limited items recovered it was not possible to determine the position of the flaps and landing gear during the approach.

Maintenance history

The aircraft had been based at Perranporth Airfield in Cornwall. The most recent airframe, engine and propeller annual inspections had been carried out in October 2012. Apart from general preparations and pre-flight inspections the most recent work carried out was a repair to the co-pilot attitude indicator and the aircraft integrated navigation system. Discussions with the maintenance company responsible for this aircraft indicate that the aircraft was in a good condition.

Autopilot

This aircraft was fitted with a Cessna 400B Navomatic Autopilot. This system is a two-axis automatic flight control system that commands servos to position the ailerons and elevators and provide automatic roll and pitch stability and tracking of any magnetic heading.

It was not known what the reported autopilot problem was. From discussions held by the owner with the aircraft maintenance companies at Perranporth and Jersey, it was thought to be regarding diagnosis and rectification of a problem with the autopilot servos. The problem was not likely to have affected the ability for a pilot to fly the aircraft manually.

Analysis

The highly fragmented state of the recovered items of the aircraft show that it suffered a high energy impact consistent with a high speed collision with the sea. None of the recovered items had any evidence of fire or heat damage and there was no evidence of bird remains. There was also no evidence of mechanical damage, such as imbedded metallic debris from an airborne break-up of an engine or propeller, on any of the recovered items. The small amount of wreckage recovered after this accident does not provide conclusive evidence as to the serviceability of the aircraft prior to the accident. However, there is no evidence to suggest that the pilot was experiencing technical difficulties; indeed, for the aircraft to enter the rapid climb would have required both engines to be under power.

The pilot knew that the autopilot was unserviceable and had successfully flown the aircraft manually to Jersey, La Rochelle and Dinan. It would also be unlikely that the pilot was relying on the autopilot during the accident flight. It is therefore considered that the autopilot was not a factor in this accident.

The pilot was properly licensed and qualified to conduct the flight. He had filed a VFR flight plan and during the transit from Dinan appeared to be maintaining VMC. He held an FAA Instrument Rating. The aircraft's autopilot was unserviceable, therefore he was probably flying the aircraft manually.

The pilot maintained a safe altitude until shortly before turning onto the final approach when he commenced a continuous descent passing through the extended centreline at 800 ft and turning onto the final approach track. Whilst initially he may have been able to align the aircraft visually with the runway, once just above or in the fog it would not have been visible. He may also have used the ILS localiser or a combination of both visual and instrument alignment, but his continued descent to 200 ft would have placed him in IMC. His comment on the radio that he had 'COMPETELY GONE WRONG WAY ROUND' suggests that at that moment he was using the localiser beam bar indication which would have been displaced to the right on the indication. It is possible that instead of turning right to centre the beam bar, he mistakenly turned left having misinterpreted the indication and would have been the 'wrong way' to recover the centre line. The fact that the aircraft had descended to a low height probably indicates that the pilot was not monitoring his altitude or had misread the instruments.

The rapid pull up manoeuvre suggests that the pilot suddenly became aware of his low height or saw the immediate proximity of the surface of the sea. Depending on how much engine power was set, the high rate of climb suggests a nose-high pitch attitude that may have resulted in a significant loss of airspeed and a stall at 600 ft. Whilst the aircraft may have cleared the top of the fog and permitted external visual references, the subsequent recovery from the stall would probably have caused the aircraft to re-enter the fog. In this type of aircraft, the altitude loss for a conventional stall is about 650 ft; the pilot therefore had limited height from which to regain controlled flight. The aircraft's speed would have increased rapidly during the final descent and this resulted in a high energy impact with sea.

Conclusion

The accident was probably as a result of the pilot's attempt to recover to normal flight following a stall or significant loss of airspeed at a low height, after a rapid climb manoeuvre having become disoriented during the approach in fog.