ACCIDENT

Aircraft Type and Registration:	Cessna F406 Caravan II, N17CK
No & Type of Engines:	2 Pratt & Whitney Canada PT6A-112 turboprop engines
Year of Manufacture:	1985
Date & Time (UTC):	8 November 2008 at 1313 hrs
Location:	Tortola, British Virgin Islands
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Damage to underside of fuselage, inboard flaps and both propellers
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	65 years
Commander's Flying Experience:	Not known Last 90 days - 20 hours (estimated from aircraft log books) Last 28 days - 10 hours (estimated from aircraft log books)
Information Source:	Aircraft Accident Report Form submitted by the pilot and reports collated by Air Safety Support International (ASSI)

Synopsis

The aircraft landed on Runway 07 at Terrance Lettsome Airport, Tortola, BVI, with the landing gear apparently in the retracted position. During the recovery, and subsequently, the landing gear operating systems were tested; no faults were found with their operation or the indication systems.

History of the flight

The aircraft was completing a VFR flight from St Thomas Airport, US Virgin Islands, with only the pilot on board. He was cleared to land and reported that he commenced the approach, selected the landing gear lever to the DOWN position and deployed the flaps. Shortly after touching down he felt and heard the propellers strike the runway and immediately cut the power and raised the nose of the aircraft as much as possible. The aircraft slid a short distance before coming to rest on its underside. The pilot selected all switches to OFF, and vacated the aircraft.

Emergency response

The airport Fire and Rescue Service, who were quickly in attendance, saw fluid leaking from both engines and the pilot moving around inside the aircraft. Communication was established with him through an open exit window and he was advised to "take the switches OFF". After the

pilot had vacated the aircraft, a foam blanket was laid around the aircraft. The assistance of a local mechanic was obtained to disconnect the aircraft battery. Air Traffic Control was kept informed of activities using a hand held radio.

Recovery

The aircraft was lifted using a mobile crane and strops, Figure 1, which enabled the local mechanic to lower the landing gear using the alternative 'blow-down' procedure. The gear lowered and locked in the DOWN position without fault and the three green, locked down, indicators in the cockpit illuminated. This procedure is available in-flight for emergency lowering of the gear should the normal system fail. The aircraft was lowered onto its wheels and towed to a hangar without further incident.

Initial inspection

Photographs of the aircraft taken immediately after the landing and during the recovery operation show the landing gear retracted with no damage apparent to any of the landing gear doors. The inboard flaps had sustained some damage to their inboard rear corners, and both appeared to be in the retracted position. In the cockpit, the landing gear lever was positioned at DOWN, and the flap lever at RETRACT.

Further examination and testing

An Airworthiness Surveyor conducted a detailed inspection of the aircraft. The following is a summary of the damage he identified:

Picture courtesy ASSI

Figure 1

Recovery Operation (courtesy ASSI)

'● *The propellers of both engines had suffered severe damage due to contact with the runway surface.*

- *The inboard lower surface of the left and right inboard flaps had substantial damage to the skin and the inboard part of the operating mechanism had been worn away due to runway contact.*

- *All aerials on the underside of the fuselage had been torn off and the mid left hand section of the wing centre box skin had been worn away. Although an aerial forward of the nose gear door had been damaged the overall damage to the aircraft underside was consistent with a nose up attitude during the runway slide.*

- *There was no damage to any of the landing gear doors. The left and right main wheel tyres had minor scuff marks on a section of their outer sidewalls.'*

With the assistance of the mechanic, the aircraft was jacked up and hydraulic power supplied to the aircraft by a ground based unit. The flaps were inspected for condition prior to operation. The damaged inboard guide roller was removed to prevent interference with the flap operation and preclude any further damage. The flaps and the flap indication system operated normally with correct indications; no abnormal noises were heard.

The landing gear was inspected for condition prior to its operation and no defects were identified. It was cycled up and down twice and, on each occasion, the landing gear operated normally with the correct indications and no abnormal noises.

A landing gear configuration warning horn is fitted to the aircraft. The horn should sound whenever the power levers are retarded to IDLE with the landing gear retracted, or whenever the landing gear is not in the locked down position and the wing flaps are extended to the landing position. During the testing, it was noted that the landing gear warning horn sounded as expected.

Aircraft documents and equipment

An Airworthiness Surveyor also conducted a detailed inspection of the aircraft log books and equipment. The following is a summary of his relevant observations:

'● *The aircraft was in compliance with its maintenance cycle and the recording of times to maintenance checks was generally accurate with minor corrections being made as required. An unusual amount of rectification work was undertaken on 01 Sept 2008 and 27 Sept 2008.*

- *The operator used aircraft and engine log pages to cover three to five days of flights.*

- *The operator did not record fuel amounts or fuel oil uplifts in the aircraft or engine log books nor any trend monitoring information.*

- *The pilot's abbreviated checklist manual was in poor condition and illegible on a number of pages.*

- *The pilot's operating handbook was in poor condition and held together with elastic bands; the weight and balance section was missing a number of pages.*

- *No weight and balance schedule could be found in the recovered documents.*

- *The cabin area and cockpit were in a poor condition including unsecured safety equipment, crew seat belt defects and general trim defects.'*

ATC

The transcript of the ATC voice recording showed the pilot contacted the tower and was advised to report at Road Town. On reaching Road Town, the pilot was cleared to land and advised of the wind speed and direction. Within the following minute, the pilot requested another wind check which was duly given by the tower. The pilot responded with "Roger, thank you. Cleared to takeoff and ah….cleared to landed and ah….. we got it." There were no further communications until three minutes later when the tower contacted San Juan to advise the runway was closed.

Analysis

The pilot stated that during the approach he selected the landing gear down and deployed the flaps. Following the accident, the cockpit flap selector lever was found in the RETRACT position and the landing gear selector was found in the DOWN position. Photographs taken immediately after the accident appear to show the landing gear and flaps in a retracted position.

Function testing of both the landing gear and flap systems demonstrated that both systems worked normally and gave correct indications in the cockpit. During the recovery operation the landing gear was lowered without any problems using the alternative 'blow-down' procedure and it is most likely that it would have done so in-flight, had the system been selected.

Also, had the landing gear been in the DOWN position, but then collapsed during the landing, the landing gear doors, due to their location and geometry, would most likely have been damaged as the aircraft settled onto the underside of the fuselage. There was no such damage seen on any of the landing gear doors.

The inboard flaps on both sides of the aircraft had damage to their inboard lower surfaces; the nature of this damage indicates that the flaps had not been in the landing position at the time of the accident.

The pilot did not report that he heard the landing gear configuration warning horn during the approach or landing. When tested during the examination of the aircraft, the horn was working normally. However, given the likely configuration of the aircraft, the warning horn would have only sounded when the power levers were retarded to IDLE after the propellers struck the runway. By this time the pilot's attention would likely have been fully occupied with what was happening to the aircraft, and may have masked his awareness of the sound of the horn.

Conclusion

No faults were found with the operation or indication of the landing gear and flap systems when tested after the accident. It is therefore possible that the aircraft was landed with the landing gear inadvertently left in the retracted position.