Jodel DR 1050, G-AZAD

AAIB Bulletin No: 10/99 Ref: EW/C99/5/2 Category: 1.3

Aircraft Type and Registration:	Jodel DR 1050, G-AZAD
No & Type of Engines:	Continental 0-200-A piston engine
Year of Manufacture:	1963
Date & Time (UTC):	9 May 1999 at 1526 hrs
Location:	2 km south of Cromarty, Highlands, Scotland
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - 1
Injuries:	Crew - Fatal - Passengers - Fatal
Nature of Damage:	Aircraft destroyed
Commander's Licence:	Private Pilot's Licence
Commander's Age:	58 years
Commander's Flying Experience:	215 hours (of which 126 were on type)
	Last 90 days - 2 hours
	Last 28 days - 0 hours
Information Source:	AAIB Field Investigation

History of the flight

The pilot, who had been flying the aircraft since February 1992, was a member of a syndicate that operated the aircraft from Inverness airport. On the day of the accident the pilot and his wife flew from Inverness to Dornoch airfield, 20 nm to the north, to take some family friends on a number local sight seeing flights. The aircraft left Inverness at 1326 hrs and arrived at Dornoch at approximately 1345 hrs.

One of the family friends at Dornoch was using a video camera to record the events. The time code recorded along with the pictures showed that the aircraft departed Dornoch on the first sight seeing flight at 1411 hrs and landed back at 1430 hrs. One of the passengers on this flight, in conversation with the pilot, stated that he (the pilot) spoke of flying from Inverness to Dornoch at 2,000 feet and having to find 'a break' (in the clouds) in order to land. The sight seeing flight was flown at a height estimated by the passenger to be 400 feet agl.

At 1448 hrs the aircraft took off for the second flight, landing at 1501 hrs. A passenger on this flight noted that during one of the manoeuvring turns the stall warning light illuminated for several seconds. When the pilot was questioned by the passenger about the light he appeared to be

unconcerned. It was subsequently learned that the syndicate members were aware that the stall warning tended to operate at a speed well above the actual stalling speed.

At 1507 hrs the pilot was seen to carry out pre-flight external checks for the return flight to Inverness. He then entered the cockpit and sat in the left seat beside his wife. Both occupants were seen to fasten their lap and diagonal seat belts and the engine was started at 1509 hrs. The aircraft departed three minutes later at 1512 hrs. The video recording showed that the prevailing weather conditions at the time of departure were VMC under overcast skies with the wind sock indicating a moderate wind.

At 1520 hrs the pilot transmitted to the Inverness tower controller that he was 'PASSING TAIN, VFR INBOUND TO INVERNESS'. He was instructed to continue VFR, report the field in sight and given Runway 06 as the runway in use with the QNH and wind velocity. He was also advised that Fort George Danger area (D702; 6 nm north of Inverness) was inactive. At approximately 1525 hrs the controller advised the pilot of a very low cloud base at Fort George and the Beauly Firth, an area to the west of Inverness. The pilot responded to this call saying that he was at the Nigg oil rig fabrication yard, 1 nm north of Cromarty on the northern shore of the Cromarty Firth, where he was still VFR with a cloud base of 400 feet. From here the pilot, in making a direct flight to Inverness airport, would have to cross the Cromarty Firth, overfly the town of Cromarty, transit ground rising to 512 feet amsl and fly close to the 'Rosemackie' transmitter mast 1,074 feet amsl before crossing the Moray Firth.

At 1530 hrs the commander of a BAe 146 aircraft inbound to Inverness from the west reported by RT, for the benefit of the pilot of G-AZAD, that there was a break in the cloud such that he could see the threshold of Runway 06 at Inverness from his position close to Inverness town. There was no response from the pilot to this information or to any further transmissions.

A witness, inside his house in the town of Cromarty, became aware of the aircraft when he heard the loud regular sound of an aircraft engine overflying the town. He stated that several minutes after hearing the first sounds he went into his garden, looked up and 'saw a small single engined monoplane with a fixed undercarriage'. The aircraft was 'banked steeply to the left, at an angle estimated to be 45° to 50°, circling into the mist'. To the north of his position he could see North Sutor (high ground on the northern shore of the Cromarty Firth) that was also covered in mist. The witness saw the aircraft circle twice and heard it continue to circle a further three times as it moved away towards rising ground to the south-west.

A second witness, in a house on higher ground 1 km south-west of the town, heard the aircraft approach. Some 30 minutes earlier he had driven to the house from the west and encountered a fog bank dense enough to cause him to drive at reduced speed. He looked from his window and saw the aircraft 'very very low travelling towards Inverness. It was following the contours of the rising ground dipping its wings to the left before disappearing over the crest of the hill in a wings level attitude at a height half that of nearby trees'. The witness estimated the aircraft's speed at the time as being between 70 to 80 mph. Some moments later the aircraft struck the ground and the occupants sustained fatal injuries.

Search and recovery

In the absence of any further transmission from the aircraft the Inverness tower controller checked possible diversion airfields for information about the aircraft. At 1559 hrs he advised the Scottish Air Traffic Control Centre (SCACC) supervisor of the situation. At 1610 hrs the police, who had

been alerted to the incident, checked Dornoch airfield in case the aircraft had returned. At 1633 hrs the SCACC supervisor instigated an alert. A helicopter pilot flying in the local area eventually located the aircraft inverted in a field south of Cromarty.

Weather

The recorded actual weather conditions at Inverness timed at 1450 hrs gave the surface wind as 040°/07 kt (varying between 010° and 080°), visibility of 8,000 metres in light rain showers with few clouds at 400 feet, scattered cloud at 2,500 feet and broken cloud at 4,500 feet. The temperature was +10°C with a dew point of +8°C and a QNH of 1005 mb.

There was little change in the recorded weather for 1520 hrs except that the visibility had reduced to 5,000 metres, the cloud at 400 feet was now scattered and the base of the broken cloud layer had lowered to 3,500 feet.

The recording of a special weather observation was carried out at Inverness at 1528 hrs. The surface wind and visibility remained unchanged but a few clouds were forming at 100 feet above the surface and the temperature and dew point had changed to +9°C and +8°C respectively.

Accident Site

The aircraft had come to rest inverted in a waterlogged depression on the top of a hill at a height of 340 feet amsl and 200 feet to the north-west of a fence oriented northeast-southwest. It had been returned to the upright position during the recovery of the occupants. The initial ground marks indicated that the aircraft had crashed on a heading of 280ûM, and had then rotated to the left through 27û before coming to rest 6 feet further forward.

There was extensive damage to the cockpit area and items forward of the main spar. The outer section of the right wing had disintegrated and, although the left wing showed no impact damage, the through box spar had failed on both sides of the fuselage. Other damage to the airframe gave an estimate of a speed of around 60 kt, with the aircraft turning to the left. There was no significant impact damage to the wheel spats or the lower engine cowling.

The propeller had stopped in approximately one revolution and both tips had failed in a rearwards direction, indicating that the engine had been under low power at impact. One blade was crushed around the top of the engine; the other blade had no further damage apart from the loss of six inches of its tip. The engine had separated from the structure, and remained attached by cables. The damage to the propeller and engine fittings, and the mud lodged in the cylinder cooling fins, showed that the pitch attitude of the aircraft at impact had been at least 30û beyond the vertical. Examination of the engine showed that it had been mechanically sound before the accident, with its bearings and accessory drives intact. The carburettor was inspected by an overhaul agency but nothing was found that could have caused a malfunction.

The airbrakes were unlocked, and had drooped approximately one inch from the closed position. Their position before the accident could not be determined. Examination of the flying controls did not reveal any pre-impact failure.

Conclusion

The pilot was familiar with the local area and was attempting a relatively short flight to return to his base. The weather was such that it would have been necessary to avoid low cloud in order to remain in VMC. The pilot was not trained or qualified for instrument flight. In manoeuvering the pilot appears to have become disoriented and crashed into rising ground, perhaps having stalled inadvertently as speed was reduced in the climb. No mechanical reason was found for the loss of control.