

No: 1/88

Ref: 1b

Aircraft type and registration: Beech Aircraft Corporation B 200 Super King Air G-MDJI

No & Type of engines: 2 Pratt & Whitney Canada PT6A-42 turboprop engines

Year of Manufacture: 1983

Date and time (UTC): 19 October 1987 at 0616 hrs

Location: Chevin ridge, Otley, South Yorkshire

Type of flight: Private

Persons on board: Crew — 1 Passengers — None

Injuries: Crew — 1 (Fatal) Passengers — N/A

Nature of damage: Aircraft destroyed by fire

Commander's Licence: Commercial Pilot's Licence

Commander's Age: 57 years

Commander's Total Flying Experience: Approximately 6000 hours (of which approximately 350 were on type)

Information Source: AAIB Field Investigation

The aircraft had been leased by the owners to another operating company who had been sub-chartered to fly to Alicante from Leeds/Bradford Airport. As the owners had not at that time been granted an Air Operators Certificate, the aircraft was being flown as a private flight, for the purpose of positioning it at Leeds/Bradford Airport for use by the lessee. To this end, the aircraft took-off at 0600 hrs from Teesside Airport, the base of the owning company, and flew at Flight Level 40 towards Leeds/Bradford Airport (LBA).

At 0607 hrs, the commander contacted the LBA radar approach control, on frequency 123.75 MHz, and received the aerodrome information "Runway in use is 14, surface wind 140/5 kt, (visibility) 4000 metres in mist, three oktas (cloud) 100 feet, seven oktas 200 feet, the QNH is 1008, QFE 983 millibars, temperature +12°, runway surface is wet". Initially, the commander did not read this information back to the controller, as is 'required', nor did the controller ask him to do so, as is 'recommended' by the Manual of Air Traffic Services. However, a few seconds later, the commander asked for confirmation of the QFE as "987 or 983". The controller then repeated both the QNH (1008) and the QFE (983).

At 0608 hrs, the controller established radar contact with the aircraft and cleared it to descend to 3500 feet on the QNH 1008. This message was again not read back by the commander. The controller then passed the recommended operating meteorological minima for non-Public Transport aircraft when making the "Localiser/DME" approach to runway 14 for which he had been cleared.

A "Localiser/DME" (Distance Measuring Equipment) approach is a cockpit instrumented landing aid comprising azimuth guidance towards the runway, simultaneously with a direct

indication of range from the touchdown point. This system of approach therefore does not provide instrumented height guidance but relies upon previously calculated comparison of height with distance to the touchdown point.

At 0611 hrs, the controller cleared the aircraft to descend to 3000 feet on the QNH 1008. This clearance the commander did read back to the controller, but incorrectly, as "... 3000 feet on 998". This again was not noticed by the controller who, at 0612 hrs, cleared the aircraft to 1900 feet on the QFE 983. Again, this was not read back by the commander nor was read-back requested by the controller. At 0613 hrs, following the commander's confirmation of arrival at 1900 feet, another clearance was issued for "further descent at 5 nm DME with the procedure, contact the Tower (on frequency) 120.3 MHz". Only the frequency change was read back and the commander called the Tower at 0615 hrs, receiving permission to continue the approach and then at 0615.50 hrs permission to land. This again was not acknowledged nor was any further contact with the aircraft established. However, the lack of an acknowledgement by the commander might, on this occasion, have been caused by an immediate transmission from another aircraft.

From 0618 hrs, repeated but unsuccessful attempts were made by the controller to re-establish radio contact with the aircraft, following which a Full Emergency was declared.

The aircraft was found to have crashed into some mature trees close to the top of the north facing slope of the Chevin ridge whilst flying at an altitude of 830 feet. The location of the wreckage was some 45 metres to the right of the extended centreline on the approach to runway 14, and 1.85 nm from the point of touchdown.

Examination of the accident site showed the aircraft to have made initial contact with the tree tops some 100 metres before the main wreckage site whilst travelling on a track of 142° M, in a wings level attitude. The aircraft had been on a gentle descent path of between 0° and 5° to the horizontal and flying at a speed of between 100 and 150 kt.

With the ground sloping up at approximately 15° at this point, the aircraft had quickly descended below tree top height (80 to 100 feet above ground level) and received serious damage from multiple strikes with the sturdier parts of several large trees. This resulted in the detachment of the right propeller, right engine, and nose undercarriage. In addition, the right wing outboard of the engine was pulled off in two sections. This had the effect of yawing the aircraft to the right, precipitating detachment of the rear fuselage and tail section by further tree contact. The remainder of the aircraft came to rest with no further structural disruption, at an altitude of 820 feet, on a heading of 315° M, up against a steep rock outcrop where an intense post-impact, fuel fed, fire took place.

Detailed examination of the wreckage established that just prior to impact the aircraft had been structurally complete and that its configuration was with undercarriage down and locked, and flaps fully retracted. Both engines had been running and producing some power, although the precise level of power could not be determined. All damage to the airframe was consistent with being caused by the impact sequence and subsequent ground fire, as were all failures in the flying control systems.

Examination of the instrument panel, which had been severely burnt, revealed little useful information except that the pilot's servo altimeter had stopped, showing 600 feet both on the drum counter and single pointer. These two indications may be considered valid, as no failures had occurred in the gear train which drives the drums/pointer. The subscale setting, however, was indicating 703 mb, but this could not be considered as reliable because these drums were driven electromagnetically and are not mechanically keyed. This altimeter had been tested and re-certificated earlier in the year.

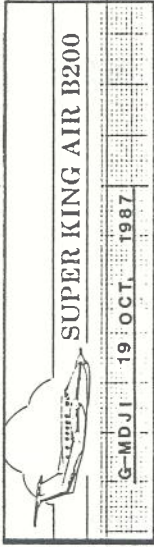
The anomaly of the flap position was resolved by evidence from people who had flown with the commander in the past. Reportedly, it was customary for him to leave the flaps in the UP position until he had visual contact with the runway. This would, in order to avoid uncomfortably high pitch attitudes, necessitate a slightly higher approach speed than might otherwise be expected, and accords with the estimated speed at impact.

The laid down descent angle for a Localiser/DME approach to runway 14 at Leeds/Bradford Airport is 3.5°. Whereas a standard 3 degree descent angle can readily be calculated and flown by a pilot using a formula of 300 feet per nautical mile, it is more difficult, particularly in single pilot operations, to calculate and achieve a 3.5° descent. An aircraft on a 3.5° approach angle, on a pressure setting of 998 mb, would pass approximately 100 feet above the accident site but, a 3° approach would result in ground contact in the area of the site. This is illustrated in the attached diagram.

GENERAL WIND 140/05, 4K MST, 3/100, 7/200, 1008, 983, +12, RWY WET

LAST ACKNOWLEDGED CALL BY PILOT WAS "DESCENDING ON 998 mb"

ALTIMETER FOUND INDICATING 600 ft



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3 degree G/S for pilot calculation giving 300 feet/NM, using the correct QFE of 983 mb. (The required and published G/S is 3.5 degrees).

