

No. 42

Associated Airways Limited, Bristol 170 Mk. 31, CF-GBT  
crashed near Thorhild, Alberta, on 17 September 1955.  
Report No. 55-48 released by Canadian Department of Transport,  
Air Services Branch, Civil Aviation Division

Circumstances

At 0021 hours Mountain Standard Time the aircraft took off from Edmonton for Yellowknife with a crew of 2, 4 passengers and a cargo of freight.

An IFR flight plan had been filed for the flight to be made at 5 000 feet over Blue Air Route No. 84. Clearance out of the Edmonton Control Area was given to the aircraft but VFR was to be maintained while in the area.

About twenty-two minutes after take-off, the tower at Namao heard a distress message from the aircraft indicating that the starboard engine had failed and that the aircraft was returning to Edmonton at 3 000 feet. Two minutes later another distress message was picked up by Namao stating that the aircraft was returning to Edmonton. Two-way communication with the aircraft was not established and although Namao and Edmonton continued to call the aircraft for more than thirty minutes, nothing further was heard from it. Although hampered by darkness and poor weather conditions, an air and ground search was started almost immediately but without success, until shortly after first light when the wreckage was found in a farm field about ten miles north of Thorhild. The pilot-in-command and one passenger had been killed and the co-pilot and three other passengers were seriously injured. The aircraft was destroyed.

There were no witnesses to the accident but evidence from the survivors indicated that the flight had been normal for about the first twenty minutes. At this time the starboard engine began to lose power, miss and backfire and was accompanied by a fluctuation of between 3"-4" of manifold pressure. This condition lasted about three or four minutes. The pilots then feathered the engine and attempted to return to Edmonton. Orders were then given to jettison the cargo and the rear door was opened and groceries, sacks of sugar and flour were thrown out for a period of about ten minutes. It was then about 0055 hours. The crew then stopped jettisoning cargo and waited for the crash which occurred almost immediately.

After the failure of the starboard engine, the aircraft lost nearly 3 000 feet of altitude in about ten minutes and crashed in the open field. The survivors could offer no satisfactory explanation for the accident and, as a result of his injuries, the co-pilot was unable to give complete details of what had occurred, although he did recall that for a time he had taken over control of the aircraft and flown during the emergency.

Investigation and Evidence

A Certificate of Airworthiness, to expire on 22 December 1955, had been issued for the aircraft. Subsequently, however, radio equipment had been changed in the aircraft by the Company and the aircraft had not then been submitted for inspection and re-certification as should have been done. Moreover, the weight used by Company despatchers did not agree with the weight given in the Weight and Balance Report accompanying the Certificate of Airworthiness. In addition, the aircraft had been weighed on 17 August 1955, and the tare weight was found to be 28 578 lbs., which was 1 332 lbs. more than the tare weight which continued to be used by Company despatchers in computing the all-up-weight although the results of the reweighing had been known by Company officials.

As a result the computation of the all-up-weight of the aircraft showed that it was overloaded at the time of the accident by at least 1 400 lbs.

Further, the aircraft was balanced by placing items of equal weight at the same distance on each side of a loading line. Thus the aircraft had not been loaded in conformity with the Certificate of Airworthiness.

A modification to the aircraft's heating system had been made prior to the flight. Shortly before the starboard engine failed, an attempt was made to start the heater without success. Almost immediately thereafter the starboard engine failed. However, no evidence

could be found to indicate that operation of the heater system was responsible for the engine failure.

While weather conditions favoured ice formation, it was not possible to determine whether this was a factor. It is improbable that ice formed in the carburetor itself since this was an injector carburetor with an oil heater barrel. It was not possible to determine whether ice formed in the air scoops to the carburetor but this could be considered a possibility in the light of the weather conditions at the time of the accident.

Thorough examination failed to reveal anything that would account for the engine failure. However, further investigation of both of the engines and carburetors is being made by the manufacturer.

A further modification had been made to the vacuum selector control. As a result of this modification only the pilot's or co-pilot's set of gyro-driven instruments would continue to operate in the event of the failure of one engine. The new operation of the selector control had not been clearly marked as should have been done nor had the co-pilot been made aware that certain of his instruments would not be giving accurate indications due to the failure of one engine.

Examination of the wreckage and ground at the scene of the accident indicated that the aircraft was in a slight turn to the right at the moment of impact. This is substantiated by one of the crew members who stated that while jettisoning the cargo the right wing was down.

Information as to the performance figures of this aircraft shows that on single-engine performance, the aircraft should not have lost altitude as rapidly as it did. However these performance figures would not apply to an aircraft that was overloaded and the performance of the

aircraft would be further decreased by the rear door being open while cargo was being jettisoned.

The weather forecast for the period 1700 hours on 16 September 1955 to 0500 hours on 17 September, indicated that a depression located east of McMurray was remaining stationary and filling slowly. The circulation was north to north easterly.

#### Northern half of the Edmonton region.

Clouds and Weather 6 000 feet broken - layers 15 000 feet intermittent light rain with ceilings 2 500 feet and visibility 3-6 miles in drizzle after 1900 hours.

<u>Icing</u>	Light in cloud above freezing level.
<u>Freezing Level</u>	6 500 feet mean sea level.
<u>Turbulence</u>	Light below 8 000 feet.
<u>Wind and Temperature</u>	At 4 000 feet 300° at 35, 6° c 310° at 30, 6c.

#### Probable Cause

For reasons not as yet determined, the starboard engine failed and as a result of being overloaded, the aircraft did not maintain altitude on one engine and struck the ground with the starboard wing tip.

A further contributory factor was considered to be the failure of the co-pilot's vacuum-driven gyro instruments, without his knowledge.