

No. 11

Aviación y Comercio, de Havilland D.H. 114, Heron 2D, EC-ANZ,
crashed into a mountain near Puigpufent, Majorca, on 15 November 1957.
Report released by the Directorate General of Civil Aviation, Spain.

Circumstances

The aircraft was on a scheduled passenger transport flight between Barcelona and Palma, Majorca. It took off from Barcelona at 1919 hours. At 2002 hours it reported to the Palma, Majorca Area Control Centre that it was above the MJ radio beacon at flight level 60. It was cleared by the Centre for an ADF approach to the Son Bonet Airport and at 2008 hours it hit a mountain located 14.5 km from the airport. The 2 crew members and the 2 passengers were killed, and the aircraft was completely destroyed.

Investigation and Evidence

The aircraft had flown a total of 465 hours and had undergone its last periodical overhaul 27 hours before its last flight.

The pilot had logged 1 912 hours of flying time, 95 of which were performed on this type of aircraft.

Weather

The synoptic charts taken at 0600, 1200 and 1800 GMT show that there was a low over the Western Mediterranean and the South of Spain. This depression was filling up rapidly and at 1800 it was confined to a small nucleus with its centre to the south of the Balearics. A broad occluded front was approaching the region of the Balearics from the south, crossing it at approximately 1800 hours. At this time, an area of continuous precipitation is shown with cloudbanks at some levels and moderate land winds from the north-east, covering a large part of the Balearics,

the Spanish coast of the Levante and Cataluña, and reaching Corsica. At altitude, a depression is also shown with its centre approximately on the Balearics and extending to high levels.

EC-ANZ was completely destroyed in the crash and the resulting explosion and fire. Examination of the wreckage and of the aircraft's navigational instruments did not disclose the causes of the accident. As apparently no one saw or heard the aircraft at the time of the accident, it was impossible to determine the direction followed by the aircraft when it struck the mountain. Finally, as no bearings were requested from the Palma D/F station, there was no indication of the track followed, and, therefore, any reconstruction of the accident must be based on hypothesis.

Hypothesis

The aircraft took off from Barcelona at 1919 hours. Its pilot gave Palma Area Control Centre his estimated time of arrival as 2001, and at 2002 reported over MJ radio beacon at flight level 60.

At this stage, he had to perform a holding procedure passing from flight level 60 to transition altitude (flight level 40). As the time required for performing such a procedure is 6 minutes, the aircraft should have returned over MJ at 2008 at flight level 40.

Furthermore, such a procedure should have permitted the pilot to detect any defective functioning of the radio compass - any erroneous indications due to radio electrical disturbances would

have been apparent if the pointer had not returned to its original indication after 6 minutes had elapsed.

ADF approach to Son Bonet Airport was cleared by Control Centre as no other aircraft was in flight at the time, and the aircraft was asked to report on starting its procedure turn, i.e. after 4 minutes on the outbound track.

If the aircraft did actually reach flight level 60 above MJ, since it did not carry out the holding procedure it is impossible to determine its rate of descent during let-down. To perform such a manoeuvre - once the radio compass has indicated passage over the radio beacon - the pilot should adjust his directional gyro to the heading of 195° indicated on the aerodrome chart (see Figure 3). In other words, he should have placed his aircraft on the outbound track toward Palma Bay and maintained this heading during three minutes after which he should have taken a 240° heading during one minute and then reported his procedure turn to Control.

Now if a line is drawn from the radio beacon MJ to the site of the accident, it will be seen that the direction of the line is 295°, i.e., that it forms an angle of 100° with the let-down heading (195°); it is possible, therefore, that in setting the directional gyro the pilot mistakenly added 100 degrees. The distance of 14.5 kilometres corresponds approximately to the distance from the beacon of a procedure turn.

The possibility of a 14-knot wind causing such a displacement in the track of the aircraft within such a short period of time must be ruled out.

Reasons supporting this hypothesis

Poor weather conditions and the rainfall prevailing at the time of the accident, coupled with the turbulence

reported to EC-AHI on the Barcelona-Palma route might have influenced a pilot whose experience was limited.

The pilot had already performed five crossings: Palma-Barcelona; Barcelona-Mahón; Mahón-Barcelona; Barcelona-Mahón; Mahón-Barcelona; on the day of the accident. His mental and physical state may have been thereby affected; hence possibly an error in setting the directional gyro.

The fact that five minutes after he had begun cloud penetration (2007 hours) he asked for the marker beacon to be started - a request seldom made by pilots - would lead to believe that he was not quite sure as to the way in which he was performing his manoeuvre.

The height of the spot where the accident occurred is 450 metres (1 500 ft); assuming the pilot was heading 295° instead of 195° it is clear that he could only have hit the mountain inbound to MJ between 2007 hours and 2009 hours since at 2006 hours he was due to report to the Control Centre on the procedure turn at a height of 670 metres (2 200 ft).

Examination of the wreckage shows that the aircraft landing gear was already down, a procedure which is generally carried out at the last stage, i.e. on approach and not on the outbound track.

Reasons against this hypothesis

A visual examination on an identical aircraft belonging to the same airline revealed that the numbers and divisions on the directional gyro are very large, fluorescent, well lighted, easy to read, and, therefore, not very liable to errors.

Furthermore, this aircraft is equipped with a large-sized magnetic compass containing a mirror and its lighting is perfect.

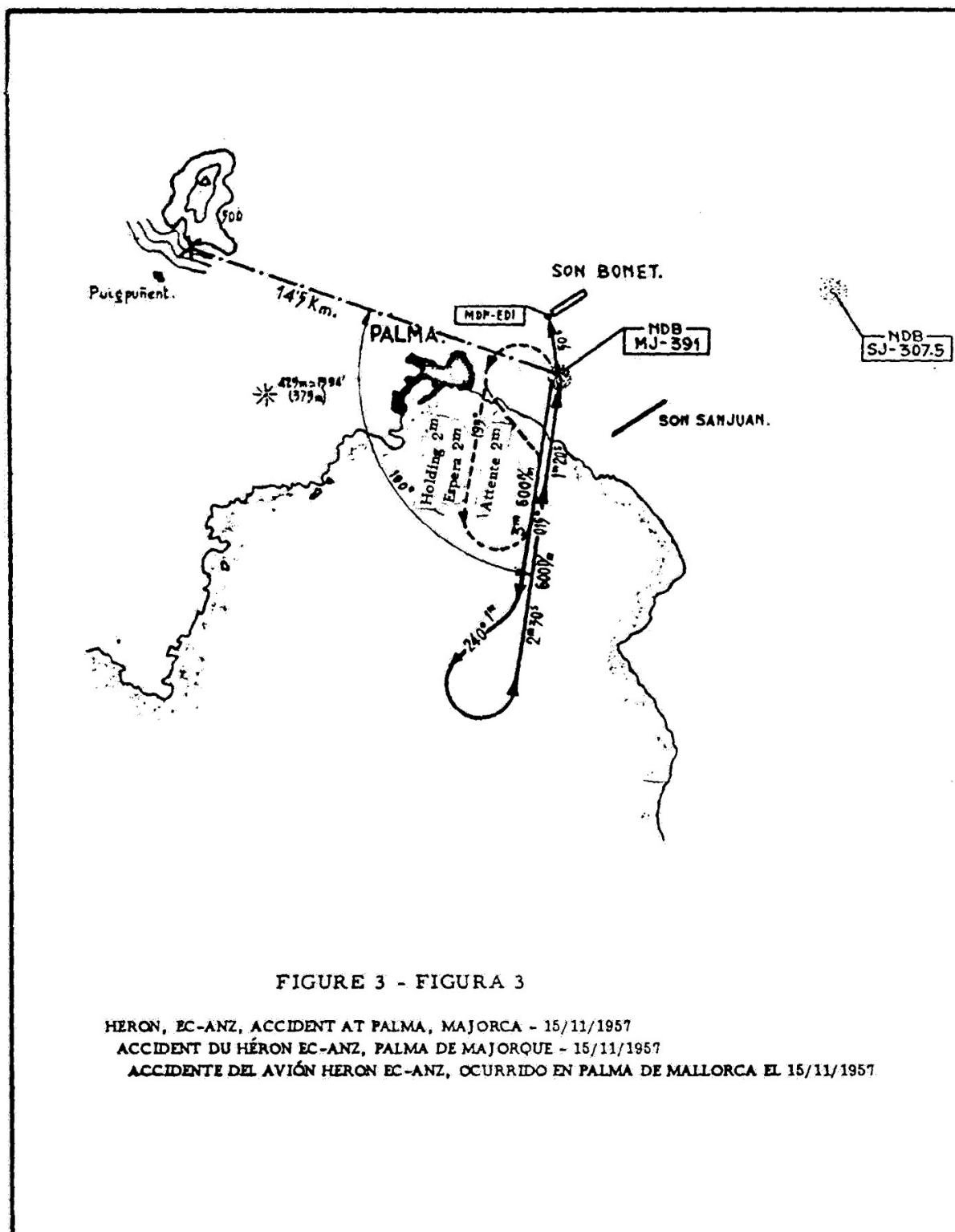


FIGURE 3 - FIGURA 3

HERON, EC-ANZ, ACCIDENT AT PALMA, MAJORCA - 15/11/1957
 ACCIDENT DU HÉRON EC-ANZ, PALMA DE MAJORQUE - 15/11/1957
 ACCIDENTE DEL AVIÓN HERON EC-ANZ, OCURRIDO EN PALMA DE MALLORCA EL 15/11/1957