

1997-06-17

L-12/97

Swedish Civil Aviation Administration

601 79 NORRKÖPING

Report C 1997:22

The Swedish Board of Accident Investigation (SHK) has investigated an incident which occurred 13 February 1997 in controlled airspace south of Bromma, AB county, involving two aircraft registered SE-DGH and TC-MEK.

In accordance with section 14 of the Ordinance on Investigations of Accidents (1990:717) the Board submits herewith a final report of the investigation.

Olle Lundström

Rune Lundin

Monica J Wismar

<i>Aircraft: registration and type</i>	A. SE-DGH , Fokker F28 MK 4000 B. TC-MEK , Learjet 60
<i>Owner</i> holm	A. Linjeflyg leasing HB/SAS, Stockholm B. Cukorova Ithalat ve Ihractat/ Cukorova Aviation Departement, Istanbul, Turkey
<i>Time of incident</i>	13-02-1997 2020 hrs in darkness, <i>Note:</i> All times in the report are given in Swedish Normal Time (SNT) = UTC + 1 hour
<i>Place</i>	In controlled airspace south of Bromma, AB county (pos 5911N 1745E; 8 500 ft above sea level)
<i>Type of flight</i>	A. Scheduled airline B. Non-scheduled passenger
<i>Weather</i>	VMC between cloud layers, visibility more than 10 km
<i>Numbers on board: crew</i>	A. 5 B. 2
<i>passengers</i>	A. 71 B. 2
<i>Personal injury</i>	None
<i>Damage to aircraft</i>	None
<i>Other damage</i>	None
<i>Pilots' age, license</i>	A. Captain 52 yrs, ATPL; copilot 30 yrs, CPL B. Captain 43 yrs, ATPL; copilot 63 yrs, ATPL
<i>Pilots' total flying hours</i>	A. Captain 6 700 hrs, of which 3 900 hrs on the type. Copilot 1 200 hrs, of which 5 hrs on the type B. Captain 4 700 hrs, of which 900 hrs on the type. Copilot 15 000 hrs, of which 700 hrs on the type
<i>Qualification of controllers</i>	The air traffic controllers in positions ARR-E and APP-S of Stockholm ACC were duly qualified

The incident was investigated by SHK represented by Olle Lundström, chairman, and Rune Lundin and Monica J Wismar, chief investigators.

The investigation was followed by Nils Björner representing the Swedish Civil Aviation Administration.

The purpose of SHK's investigations is solely to prevent future accidents and incidents.

Course of events etc.

Aircraft **A**, on a scheduled passenger flight from Ronneby, was performing a straight in approach to runway 01 at Stockholm/Arlanda via the Trosa VOR beacon. **A** received a clearance from air traffic controller in position ARR-E at Stockholm ACC to descend to flight level (FL) 90 (9 000 feet) after passing Trosa.

Aircraft **B**, which took off from Bromma airport, runway 12, at 1918 hrs on a non-scheduled passenger flight to Istanbul, called the air traffic controller in the combined ATCC position DEP-W/APP-S (W/S) and initially received clearance to climb to 4 000 feet.

Immediately after this W/S called the controller in position ARR-E over the interphone and asked about available altitude space for **B** after start south from Bromma. Considering the clearance for **A** to descend to FL 90 ARR-E gave altitude space up to FL 80, which would give the required altitude separation of 1 000 feet between the aircraft.

After the interphone conversation ARR-E called **A** and reminded the pilots to maintain not less than FL 90 and informed them about other traffic passing below.

W/S gave **B** clearance to climb to FL 80, which was correctly acknowledged by the pilots on board **B**.

Shortly before the radar blips merged both traffic controllers realized via the answers from the altitude transponders that **B** was climbing through FL 80. W/S immediately ordered **B** to descend to FL 80 and advised about opposite traffic above. ARR-E called **A** and repeatedly ordered "expedite climb" and informed **A** that there was traffic straight ahead. On the radar screens the aircraft echoes overlapped without the traffic controllers being able to distinguish any altitude separation.

The captain of **A** has stated that when the traffic information was given they could already see the navigation lights of the opposite aircraft and immediately realised that the opposite traffic would pass to the right and slightly below. He decided not to climb on the grounds that there was too little time for such a manoeuvre and that a sharp reversal to climb might have injured the passengers, who had not yet been ordered to fasten their seat belts.

The captain of **B**, piloting the aircraft, has told SHK that while passing FL 70 climbing, he had a fault on his (the left) Air Data Computer (ADC), which caused loss of the presentation from his electronic flight instrument system (EFIS). While he was transferring to fly on the standby instruments the cleared altitude was exceeded. He and the co-pilot were just about to request clearance back to Bromma when they managed to reconnect the left EFIS and could continue according to plan. During the course of events he observed 8 450 feet as the highest altitude reading. He returned to FL 80 as quickly as possible.

In a letter answering SHK's specific questions the captain later stated that the aircraft was flying on autopilot when the incident occurred and that the left instruments were sending flight data to the autopilot. He further estimated the EFIS fault to have last 10-12 seconds. A copy of the technical report of the aircraft was also submitted stating that the left ADC had had an intermittent

fault and that subsequent technical investigation revealed no fault on the equipment.

On the recorded radar information it can be seen that **B** passed FL 80 climbing approximately 3 NM before the aircraft met. **A** was then descending through FL 97. According to the recording the lateral distance between the aircraft was 0,4 NM at the closest and the altitude separation was 500 feet at the lowest. The required separation between aircraft is minimum 3 NM laterally or 1 000 feet in altitude.

Statement of the Board

The incident was caused by the aircraft **B** exceeding its cleared altitude. According to the statement of the captain of **B** the exceedance was caused by an intermittent fault on the instrument presentation to which the autopilot was coupled. The aircraft type, Learjet 60, has a very good climb performance which can explain the difficulty to quickly switch over to standby instruments and at the same time stop the rapid climb.

Through quick intervention by the two air traffic controllers and the fact that the captain of **A** saw the navigation lights of **B**, a more serious incident was avoided.