

the reporting point BEREK and so they attempted to identify its position. It was not stored in the Flight Management System computer, nor, as it is not a reporting point on the upper airway system, was it on the high level enroute chart they were using; they later confirmed its location on the London area chart. The descent continued normally and, at about 0929 hrs, the aircraft was approaching BEREK on a south-easterly track, passing FL135.

The controller had given a radar heading of 030° to another aircraft under his control to facilitate its climb against other sector traffic; it was a Jetstream maintaining FL120. He was aware that this would mean that it would cross beneath the Airbus, in the vicinity of BEREK, but believed that, as he had cleared the latter to FL130, the standard vertical separation of 1,000 feet would be maintained. Analysis of recorded radar data indicated that, at 0929:12 hrs, the Airbus descended through the cleared level of FL130.

The Daventry west sector controller reported that, shortly before the data blocks from the two aircraft merged on his radar screen he noticed that the level display from the Airbus was slightly below the cleared level. Consequently, at 0929:34 hrs, he asked the Airbus to "confirm you're maintaining flight level one three zero" and the reply was "one three zero". A frequency change was then passed. It was during this exchange that the crew realised the altitude selector was reading '12000' and that this was the level for which the flight system was programmed. Immediate action was initiated to recover to FL130. The Jetstream crew first saw the Airbus in their 11 o'clock position at about ½ nm; before they could take avoiding action, it had passed in front of them, from left to right. At about 0929:35 hrs the Airbus crossed the Jetstream's track, about 2,000 feet in front and 200 feet above.

By 0929:42 hrs the two aircraft data blocks separated again and the altitude display on the Airbus was '121'. The controller became aware of this and, at 0930:05 hrs, again asked the aircraft to "confirm you're flight level one three zero". The reply was "we slipped down a little bit; we're coming three zee...one three zero". The Jetstream commander filed an airmiss report timed at 0930:07 hrs.

An aftercast, supplied by the Meteorological Office at Bracknell, indicated that there was no cloud or significant weather in the area, and estimated that the inflight visibility was probably unlimited at the time of the incident.

The commander and first officer of the Airbus were interviewed the following day. They were certain that, at the time the clearance was given the altitude selector had been set to '13000' and the setting confirmed. However, when the aircraft was later reclassified to 9,000 feet, the commander noted that, when he pulled the altitude select control to initiate the descent, he inadvertently changed the thousands

digit to an '8'. He considered that there was a strong possibility that he had done the same thing when the initial descent clearance had been given at FL370.

The company's Aircraft Operating Manual had, as part, a Pilot's Reference Manual; this provided general descriptions of the aircraft systems, their associated controls and indicators, and provided guidance on their normal mode of operation. The Autoflight section contained the following paragraph, dated "Apr 13, 1989";

"INITIATING ALTITUDE CHANGES

To prevent inadvertently changing the altitude selected when initiating a level change with the altitude select control, use the following procedure:

--Pull the altitude select control straight out; do not rotate it.

--After releasing the altitude select control, verify that the correct altitude shows in the FCU ALT SEL window and on both PFD altitude deviation scales."

The procedure is designed to counter the problem experienced by the crew, however, on this occasion the confusion over the reporting point BEREK caused a distraction which led to the crew omitting the verification that the correct altitude was shown in the altitude selector window and on the primary flight display. Neither pilot had noticed the digit change and they had later subconsciously accepted the setting of '12000' as the cleared level.

The investigation revealed other occasions when an inadvertent change of selected level had occurred in this manner, on both the A310 and the A320 aircraft and noted that, while it was a relatively common occurrence it was seldom the subject of a formal report.

In the course of the investigation the radar replay facility at LATCC was used. The system has several shortcomings which make it less than ideal as an investigative tool. The following were identified;

- a. Both the radar and radio tapes contain an accurate time base, however, the two are presently manually rather than electronically correlated. It is difficult to achieve

accurate synchronisation using the manual system; there can be, typically, 10 seconds of lead/lag.

b. In addition to the currently available radar data playback, it would be advantageous to be able to replay the radar picture which the controller would have seen at the time of the event.

c. When a photographic record of the radar screen is made, the event time at which each exposure is taken is read from a clock, remote from the screen, and a handwritten record is made. An on-screen time display, which could be moved into the camera's field of view would allow greater time/record accuracy.

d. The technique used to produce video recording from the radar/radio tapes produces both inadequate synchronisation and misleading scaling; typically the latter causes data blocks to start to garble, on the video record, some three sweeps before they would on the radar screen on its normal setting.

There was no evidence to suggest that the controller's actions contributed to the incident, however, it was noted that ATCOs do not have the facility for regular reinforcement of their training in the handling of abnormal/emergency situations.

SAFETY RECOMMENDATIONS

As a result of the findings associated with this investigation, the following safety recommendations were made;

92-14 It was recommended that Airbus Industrie modify the Airbus flight control system in order to prevent the inadvertent change of selected altitude when the selected autopilot mode is engaged.

92-15 It was recommended that the CAA define the requirements of an effective radar/RTF replay system for incident/accident investigation and implement them as soon as practicable.

92-16 It was recommended that the CAA make provision for ATCOs to receive regular periodic training in the handling of abnormal/emergency situations and that it be a requirement for them to satisfactorily complete such training.