

No. 38

Jugoslovenski Aerotransport, Convair 340, YU-ADA, crashed on approaching Munich-Riem Airport, Germany, on 22 December 1956. Report released by Luftfahrt-Bundesamt, Federal Republic of Germany.

Circumstances

The aircraft was on a scheduled flight from Belgrade to Munich-Riem Airport with an intermediate refueling stop at Vienna. It departed from Vienna for Munich at 1837 hours, local time, with 30 people aboard. At 2033, after passing Munich NDB at 12 000 feet, the flight reported to Munich Area Control Centre and shortly thereafter was instructed to descend to 10 000 feet. The pilot was asked whether he wished an ILS approach monitored by GCA but he decided on a GCA approach. At approximately 2048, after overflying non-directional beacon DHR (35 km east of Riem airport), a further descent to 7 000 feet was carried out. A subsequent instruction to descend to 4 000 feet was also complied with and the pilot was asked to notify GCA when passing 6 000 feet. At 2053 the flight was cleared for a direct instrument approach to runway 25. At 2056 it reported passing 6 300 feet and at 2058 as having reached 3 500 feet. It was then cleared to descend to 3 000 - this altitude was to be maintained. The flight was then 7 miles east of the airport. At 2059 the pilot reported leaving 3 000 feet and was requested to carry out the necessary cockpit checks for landing. GCA ordered a course of 240 degrees and advised the pilot that he was 4.5 miles from touchdown. He was requested to maintain 3 000 feet and was ordered to pull up to this altitude as he was below the minimum height of his glide path. No answer was received. The aircraft struck the ground at approximately 2103 hours, killing 2 crew members and 1 passenger and injuring 12 others.

Note:- The above altitudes are above mean sea level. The Munich-Riem Airport altitude is 1 732 feet.

Investigation and Evidence

The captain, who was acting as an instructor on this particular flight, was seated in the right-hand seat of the cockpit and was listed as pilot-in-command of the aircraft. The co-pilot was in the left-hand seat.

The following weather conditions were observed by Munich Airport MET Office at

2050 hours and no appreciable change was noted before or around 2103 hours, the time of the accident:

surface wind -  
approx. 210 - 230 degrees, 2 - 3 knots

visibility -  
between 1.0 and 1.5 NM

moderate snowfall

8/8 FS at 700 ft., precipitation ceiling

QNH - 1017.6 mb. QFE - 955.6 mb.

The weather conditions at the scene of the accident at the time when the crash occurred were reported by Munich Airport MET Office to have been as follows:

wind close to ground -  
approx. 210 - 240 degrees, 3 - 5 knots

visibility -  
1.0 - 1.5 NM, possibly only 0.7 - 1.0 NM

moderate snowfall

cloud base approximately 600 - 800 feet

fluctuating QNH between 1017 and 1018 mb.

temperature on ground -1°C

The weather conditions en route between Vienna and Munich were normal.

The point of first impact was at a distance of 6.85 km from the runway threshold and 200 metres to the right (north) of the glide path.

The aircraft touched the ground with its left undercarriage and its left wing almost simultaneously. Both were destroyed at that point. Parts of the wing and the port engine, however, were still connected with the fuselage and were dragged along further. The aircraft then turned around its longer axis onto its back whereupon the right wing as well as parts of the rudder were also torn off. In this position the fuselage slid along until it came to a standstill. The distance from the first point of

impact to the point where the wreckage came to rest was 400 metres. Only short stubs of both torn off wings remained attached to the fuselage as well as the damaged elevator unit.

The fuselage had split across on the left-hand side, the fracture being at the level of the second window. The panelling of the ceiling was ripped open. A passenger was thrown out of the aircraft while it was sliding along the ground. Whether he was properly fastened to his seat at the time of the accident could not be determined with certainty.

Objects in the cockpit obviously had had to be moved in order to remove the bodies, and this made it almost impossible to determine the exact position of levers and switches at the time of the accident.

The left-hand altimeter showed a setting of 28.33 inches, the right-hand one 30.03 inches. At 2034 hours Air Traffic Control gave the aircraft a QNH value of 1018 mb or 30.06 inches.

No traces of icing were noticed on any parts of the aircraft immediately after the accident.

No evidence of technical defects of any kind was found.

According to the position of one limit switch, the wing flaps were extended to approximately 20 degrees. The landing gear was down. Both propellers and one governor were carefully examined by experts. The Commission of Inquiry, after considering the outcome of the examination, came to the conclusion that these particular parts did not show any evidence of malfunctioning at the time of impact.

The ground ILS equipment was checked on 22 December before and after the accident and was found to be functioning normally on both occasions. The ILS was also used by three other aircraft on the day of the accident between 1908 and 2333 hours and no deficiencies were reported.

According to the recorded R/T communications, the captain confirmed that the cockpit check had been carried out. When asked (at approximately 2059 hours) by GCA for the present course, the co-pilot answered, but his reply was interrupted in the middle of the sentence and instead of "270 degrees", only the first digit (2) could be heard. At this point

the tape only recorded a brief cracking noise. No further report was received from the aircraft. The co-pilot testified that further communication from GCA to the aircraft had been heard by him, referring in particular to the request to follow a course of 240 degrees.

At this moment, the aircraft was located somewhat north (in terms of the flight direction: to the right) of the outer marker, the light signals of which were noticed by the co-pilot on the receiving instrument. Based on the reported altitude of 3 070 feet above sea level, the aircraft was 420 metres (1 380 feet) above the ground.

Immediately after the request from GCA to follow a course of 240°, the aircraft rapidly lost altitude. The co-pilot testified that the nose of the aircraft dipped, and both the altimeter and rate of descent indicator showed a sudden loss of height.

The distance between the outer marker and the runway threshold is 8.47 km, while the distance between the first point of impact and the runway threshold was 6.85 km. The elevation of the site of the accident is 517 metres (1 705 feet) above sea level. The above factors show that the aircraft lost 420 metres (1 380 feet) in altitude over a distance of approximately 1.6 km. Considering the damage to the aircraft, caused by the impact, which must have taken place almost tangentially, it must have been travelling at a high rate of forward speed.

Assuming the true airspeed to have been 300 km/hr, it must be concluded that the average rate of descent must have exceeded 20 m/sec (4 000 feet/min) from the time the aircraft left 420 metres (1 380 feet) until the impact with the ground.

During the descent GCA noticed that the aircraft was dropping dangerously low. The attention of the pilot-in-command was immediately drawn to the fact by several calls in rapid succession, and he was urgently requested to pull up.

The co-pilot testified in his written report of 27 December as follows:

"I noticed a certain jerk as if the aircraft was suddenly descending in a steeper glide and had the impression that we were rapidly losing altitude.

As far as I can remember, the altimeter and rate of descent indicator showed a very rapid loss of altitude at this moment. I presume that I reacted to the situation on the controls in the normal manner."

Considering the above statement, the suddenly increased speed of descent could have been caused by the fact that the aircraft was pulled up to too great an extent which resulted in a subsequent dive.

Even after a most thorough investigation of all reports, testimony and evidence, the Commission of Inquiry was not in a position to reach a final conclusion as to what caused the accident. The Commission is of the opinion that a further clarification would be possible if the surviving co-pilot, who is suffering from retrograde amnesia, could be questioned once more on certain points of his written declaration, in particular in regard to the question whether and how far piloting led to a fast let-down of the aircraft from which it could not be brought up again in time.