

**No: 11/92**

**Ref: EW/E92/8/1**

**Category: 1b**

**Aircraft Type and Registration:** IA-63 Pampa, E-813

**No & Type of Engines:** One Garrett TFE 731-2-2N turbofan engine

**Year of Manufacture:** 1992

**Date & Time (UTC):** 31 August 1992 at 1033 hrs

**Location:** Bournemouth International Airport, Dorset

**Type of Flight:** Display practice

**Persons on Board:** Crew - 2 Passengers - N/A

**Injuries:** Crew - Fatal Passengers - N/A

**Nature of Damage:** Aircraft destroyed by impact and fire

**Crew Licences:** Argentine Airline Transport Pilot's Licences

**Commander's Age:** 49 years

**Co-pilot's Age:** 35 years

**Commander's Flying Experience:** 5,104 hours (of which 79 were on type)  
Last 90 days - 10 hours  
Last 30 days - 5 hours

**Co-pilot's Flying Experience:** 4,034 hours (of which 224 were on type)  
Last 90 days - 45 hours  
Last 30 days - 23 hours

**Information Source:** AAIB Field Investigation with participation by Argentine Military officials

Since the accident involved a military aircraft which crashed on a civilian airfield, an investigation was conducted by the AAIB under The Air Navigation (Investigation of Air Accidents involving Civil and Military Aircraft or Installations) Regulations 1986.

The IA-63 Pampa is a basic jet trainer built by FMA (Military Aircraft Factory in Cordoba, Argentina) and has been flying in Argentina since 1984. This series production aircraft, registered as E-813, had been brought in an Argentine C130 aircraft to Bournemouth International Airport to be assembled, before flying to Farnborough to take part in the SBAC show. The manufacturers had received all diplomatic and local clearances necessary for both the practices at Bournemouth and the display at Farnborough.

At Bournemouth, following assembly, the aircraft was flight tested on Saturday 29 August by the FMA Director of Flight Test Evaluation, their Chief Test Pilot, who also carried out a practice display routine during the 30 minute test flight. However, because of his lack of currency on type, he was not the pilot who was planned to display the aircraft at Farnborough. The company test pilot who was to display at Farnborough then carried out three practice display flights totalling one hour. At 1028 hrs on the following Monday, the Chief Test Pilot, flying as aircraft commander, took off to practice the display routine again, with the other test pilot flying as co-pilot in the rear seat.

The aircraft was seen to complete the initial part of the routine, consisting of a flat tight turn through 360° to the right immediately after take-off, a climb to a hammerhead stall followed by a downwards half roll, then an Immelman half loop and roll off the top before entering an intentional spin. The aircraft completed two turns in this spin and recovered into a vertical (downwards) roll to re-align along runway 26 before starting to pull out of the dive.

Although the height of the aircraft at this point is in some doubt, it was noted by all witnesses to be very low and one witness, who had flown the Pampa, stated that a safe recovery to level flight would have been very difficult in the height remaining. The aircraft was then seen, and recorded by video camera, to yaw and pitch into what appeared to be a one turn spin to the left, with a pitch-down angle of about 40° and rotating at a rate of about 130°/second. The rotation then ceased, with the aircraft pointing almost vertically downwards and orientated to the north, before a marked yaw to the left preceded another pitch-up, characteristic of entry into another spin to the left. Exactly at this point, the aircraft struck the ground and burst into flames.

Less than a second before impact, the start of an ejection sequence (subsequently shown to be the rear seat) was seen but the combination of aircraft sink rate and the very low altitude did not allow time for the parachute to open completely. Both occupants were killed at impact.

Three vehicles of the Airport Fire Service attended the accident site within two minutes and 70 gallons (318.5 litres) of FFFP agent were used to extinguish the fire. The Airport Security Police and the Civil Emergency Services also attended the accident.

### **Technical examination**

Examination of the impact marks showed that the first contact with the ground was with the aircraft close to a level attitude but at a high vertical speed. The geometry of the marks showed that, at impact, the aircraft was slightly nose-up (between 4 and 8°) and yawed to the left (about 5°). At the initial impact the engine and jet pipe became detached and the majority of the remaining airframe rotated

rapidly to the left, coming to rest in about 60 metres. Fire broke out while the aircraft was moving but was limited to the forward fuselage as fuel was not being carried in the wing tanks.

The aircraft was equipped with an ejection seat for each crew member and the system was selected to the 'Individual' mode. It was found that the firing handle for the rear ejection seat had been pulled and the seat and its occupant (the co-pilot) had left the cockpit. The co-pilot's parachute canopy was found partially deployed but it was apparent that the ejection sequence was not complete before the aircraft struck the ground. The firing handle for the front seat was still in place, showing that the pilot had not attempted an ejection.

The engine was disassembled and examined in detail at an overhaul facility: This examination showed that both spools of the engine appeared to be operating normally at the time of the accident. Both spools stopped rapidly in the impact and the lack of damage to the engine fan and the low pressure (LP) components indicated power at impact in the range of idle to medium power. This was consistent with marks in the throttle quadrants and the position of the input to the fuel control unit (FCU), showing the throttle to have been set at idle power when the aircraft struck the ground.

The IA-63 Pampa has hydraulically-powered primary flying controls in all three axes. The examination of the wreckage showed that all the fractures within the control system were caused by the impact loads and that, at the time of the accident, the flying control system was operating correctly, with hydraulic power supplied. All three control axes have electric motors for trim position and these trim motors were measured to determine trim position at the time of the accident. The rudder and aileron motors were both very close to the centre of their travel (*ie* neutral trim) but the trim motor for the all-moving tailplane was in a position corresponding to a substantial amount of nose-up trim, approximately 10% from the end of its travel.