

AAIB Bulletin No: 2/93

Ref: EW/C92/9/5

Category: 4

**Aircraft Type and Registration:** (1) McDonnell Douglas DC9 - 32, G-PKBE  
(2) Boeing 747-400, PP-VPG

**No & Type of Engines:** (1) 2 Pratt & Whitney JT8D-11 turbofan engines  
(2) 4 General Electric CF6-80 turbofan engines

**Year of Manufacture:** (1) 1970  
(2) Unknown

**Date & Time (UTC):** 25 September 1992 at 1500 hrs

**Location:** Runway 09R holding area at London Heathrow Airport

**Type of Flight:** (1) Public Transport  
(2) Public Transport

**Persons on Board:** (1) Crew - 4                      Passengers - 30  
(2) Crew - 22                      Passengers - 141

**Injuries:** None

**Nature of Damage:** (1) Paint scrape on underside of elevator and stabiliser  
(2) None

**Commander's Licence:** (1) Airline Transport Pilot's Licence  
(2) Airline Transport Pilot's Licence

**Commander's Age:** (1) 47 years  
(2) Unknown

**Commander's Flying Experience:** (1) 8,500 hours (of which 2,500 were on type)  
(2) Over 25,000 hours (hours on type unknown)

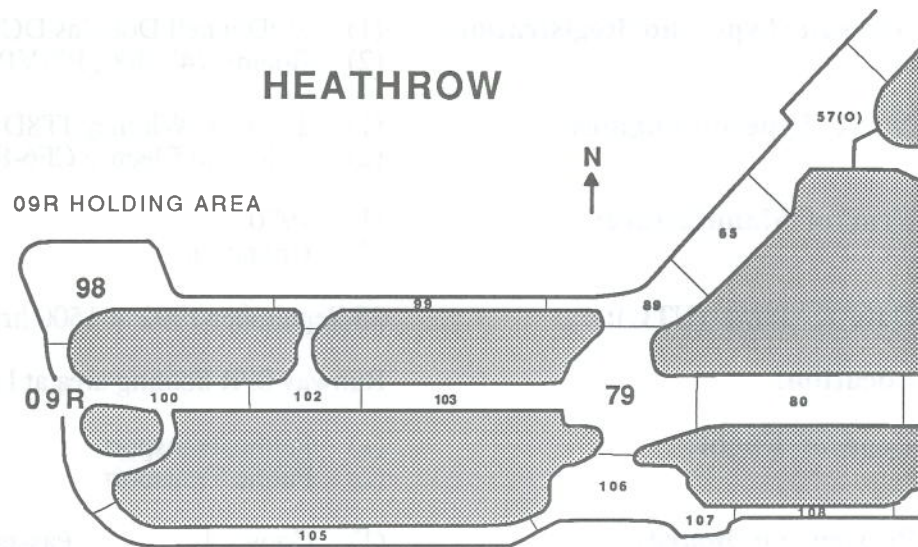
**Information Source:** AAIB Field Investigation

### History of the Incident

Runway 09R at Heathrow has a take-off run available of 3,658 metres. Aircraft which do not need to use the full length to meet scheduled performance criteria (most short to medium range aircraft) are able, with ATC permission, to begin the take-off run from an intersection known as block 79 which provides a take-off run of 2,919 metres. Aircraft which depart from all terminals except terminal 4 are, with ATC clearance, able to overtake other aircraft between blocks 57(O) and 89 but thereafter the taxiway is too narrow for overtaking. Beyond block 89 the taxiway is approximately 23 metres wide until at block 98 it expands to form a holding area which is about 108 metres wide and 210 metres long. Holding in this area allows ATC some flexibility in allocating clearance for take-off to aircraft which

do not arrive at the threshold in the correct order for expeditious departure. A diagram of the relevant section of the airport with the block numbers is shown below.

The DC-9 taxied from Terminal 1 in plenty of time to make its approved departure time. Before reaching block 79 the crew were instructed to change to tower frequency. At this stage there were about five aircraft ahead of the DC-9 awaiting clearance to take-off. On making contact



with the tower controller the DC-9 crew implied that they could accept take-off from block 79 if ATC wished. ATC instructed them to taxi for a full-length take-off. On reaching the holding area the DC-9 crew cleared the taxiway by turning right but there were two aircraft already in the hold and there was insufficient space to allow the DC-9 to turn to parallel the taxiway or face the threshold. This left the DC-9 parked behind an Airbus in a position well clear of the taxiway but with its tail closest to it on a heading of about 330°.

The 747-400 taxied from Terminal 3 after the DC-9 and at an appropriate time to make good its approved departure time. Light rain was falling but the visibility was good in daylight. On changing to tower frequency, the crew were instructed to taxi for a full length take-off. Before they arrived at the holding point, the 747-400 crew were cleared to line-up; this clearance required the 747 to pass all three aircraft holding on the apron in block 98. The commander of the 747 was aware that clearance between the the DC-9's tail and the right wing tip of his 747 would be 'tight' and so he moved his aircraft slightly to the left of the taxiway centreline to increase the separation. He was assured by his co-pilot that there was sufficient clearance between the two aircraft and so he continued forwards. As the 747 passed them, the DC-9 crew felt an impact. They immediately reported to the tower controller that they had felt a slight thump as the 747 passed them. The 747's line-up clearance was cancelled and both aircraft were instructed to hold their position pending a visual inspection by one of the airport's operations staff.

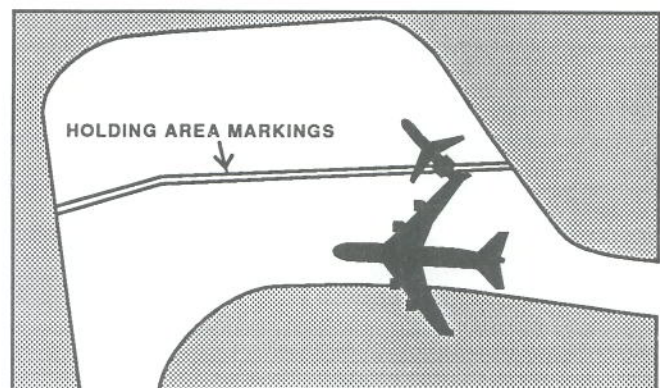
The inspection was completed within 5 minutes of the collision. Damage to the DC-9's tailplane was evident and this was attributed to contact by the 747's navigation light but there was no visible damage to the winglet. ATC informed the crews that a collision had occurred and the DC-9 crew requested

clearance to taxi back to a stand for a damage inspection. When ATC asked the 747 commander to return to the Terminal he declined to do so on the grounds that he thought it impossible that his aircraft had touched the DC-9. The 747 commander persisted in asking for departure clearance and refused advice to return to the Terminal for a damage inspection on the basis that he was sure his aircraft had not hit the DC-9 and, even if the winglet was damaged, the aircraft was still safe to fly. The discussion between ATC and the 747 commander continued spasmodically over the next 10 minutes. During this time the back-log of aircraft awaiting departure increased and the orderly flow of traffic was badly disrupted although some aircraft were cleared to take-off either from block 79 or from the full length after gaining access to the runway from the southern taxiway. At 1518 hrs ATC finally allowed the aircraft to line-up and depart at the commander's discretion and it took-off at 1521 hrs for Copenhagen.

### **Aircraft Examination**

The DC-9 was examined shortly after the incident by a senior engineer. Damage to the paint on the underside of the left stabiliser and elevator was obvious but there was no deformation of the structure and the aircraft was cleared for return to service pending repairs to the paintwork. After the Boeing 747-400 took off but before it departed from Copenhagen, the airline's station manager requested by telephone and telex that a damage check be carried out by Danish engineers. This was done but no reference to the check was entered in the aircraft's maintenance log apparently because no damage was found. The aircraft was examined by the AAIB later that night on its return from Copenhagen to London under the command of another Captain. There was no apparent damage to the the winglet apart from erosion of the paint at the rearmost tip of the winglet.

The approximate positions of the 747-400 and DC-9 at the moment of collision have been identified from marks on the DC-9 and sketches provided by the 747 commander and airport authority. The damage was limited to paintwork probably because the flexibility of the 747-400 wing allowed it to bend slightly downwards as the swept-back winglet struck the rear of the DC-9's elevator.



## Regulations

It is a basic ICAO principle that when one aircraft overtakes another on the ground, it is the commander's responsibility to ensure that there is adequate separation; this responsibility cannot be delegated to air traffic control. Moreover, although the aircraft had not taken-off when the collision occurred, the flight had begun when the aircraft taxied and so the commander was solely responsible for determining whether it was safe to continue the flight.

From the ATC perspective, situations such as this are covered in the UK Manual of Air Traffic Services Part 1 Chapter 4 paragraph 7. In essence, the aerodrome authority and certain other persons have the authority to prohibit flight and they may instruct controllers to withhold a clearance. However, in the absence of such an instruction, if a controller has reason to believe that a planned flight is liable to endanger life or involve a breach of legislation he should warn the pilot of the hazardous condition or breach of legislation and obtain an acknowledgement of the message. If the pilot still requests take-off clearance after acknowledging the warning he should be advised, when traffic permits, that there are no traffic reasons to restrict take-off. The phraseology to be used is contained in an attachment to Appendix E of the Manual.

