

# Boeing 747-400, C-GAGM and Boeing 777, N770UA

## AAIB Bulletin No: 9/97 Ref: EW/G96/05/23 Category: 1.1

<b>Aircraft Type and Registration:</b>	(i) Boeing 747-400, C-GAGM (ii) Boeing 777, N770UA
<b>No &amp; Type of Engines:</b>	(i) NA (ii) NA
<b>Year of Manufacture:</b>	(i) N/K (ii) NK
<b>Date &amp; Time (UTC):</b>	1215 hrs on 14 May 1997
<b>Location:</b>	Block 75 adjacent to Runway 27L, London Heathrow
<b>Type of Flight:</b>	(i) Scheduled Public Transport (ii) Scheduled Public Transport
<b>Persons on Board:</b>	(i) Crew - 14 - Passengers - 278 (ii) Crew - 17 - Passengers - 264
<b>Injuries:</b>	(i) Crew - None - Passengers - None (ii) Crew - None - Passengers - None
<b>Nature of Damage:</b>	(i) Minor damage to left winglet. (ii) Substantial damage to right aileron and right wing leading edge slats.
<b>Commander's Licence:</b>	(i) Airline Transport Pilot's Licence (ii) Airline Transport Pilot's Licence
<b>Commander's Age:</b>	(i) 58 years (ii) 54 years
<b>Commander's Flying Experience:</b>	(i) 28,000 hours (of which 2,400 hours were on type) Last 90 days - 110 hours Last 28 days - 61 hours

(ii) 19,000 hours (of which 800 were on type)

Last 90 days - 150 hours

Last 28 Days - N/K

**Information Source:**

AAIB Field Investigation

The Boeing 777 was cleared to taxi for departure from the south-western side of the central terminal area for a departure from Runway 27L via the outer taxiway and blocks 73, 74, and 131 to hold on the left of block 75 to await line up clearance (see Figure 1). The aircraft was not able to enter block 75 completely and stop parallel to the traffic flow due to a stationary Fokker F27 and Airbus A320 ahead in the queue. The aircraft did, however, stop with its nose wheel on or close to the taxiway centreline.

The Boeing 747-400 was cleared to taxi from Stand M26, to the north-west of the central terminal area, to the 27L hold via the outer taxiway, Runway 23 (blocks 49 and 48), blocks 54 and 131 to hold on the right of block 75. The B747 had to stop short of the block initially as an A300 was stationary ahead. After the A300 departed the commander of the B747 was cleared to 'line up on 27L' and taxied his aircraft to pass to the right of the stationary B777 (see Figure 2). He reported that he was able to see his aircraft's left winglet and kept a close view of it as he proceeded at an estimated taxi speed of 1 to 2 kt. He also stated that he manoeuvred his aircraft 3 to 4 feet to the right of the taxiway centreline to increase the clearance between wingtips.

After the aircraft had passed the commander of the B777 transmitted "WE ARE GOING TO HAVE TO RETURN TO THE GATE, PASSENGERS ARE TELLING US THAT THE AIRCRAFT GOING BY GOT OUR WING". ATC replied "JUST CONFIRM THAT HE'S ACTUALLY HIT YOUR WING HAS HE?.....JUST HOLD ON THE LEFT, DO YOU REQUIRE THE EMERGENCY SERVICES?". The commander of the B777 responded "NO SIR, WE JUST WANT TO GO BACK TO THE GATE". The commander of the B747 then transmitted "YES WE HEARD THAT, WE WERE 6 FEET CLEAR OF THE WING SO THE PASSENGERS IMAGINING". ATC then asked the commander of the B747 "...JUST CONFIRM YOU ARE HAPPY TO DEPART OR DO YOU WANT SOMEONE TO HAVE A QUICK LOOK AT YOUR PORT WING TIP". The commander replied "NO WE SAW IT VISUALLY, WE WERE KEEPING SPECIFIC VIEW". After a further discussion between ATC and the commander of the B777 regarding the damage and his intentions, the commander of the B747 transmitted "TOWER.....I THINK THAT AS THEY FELT SOMETHING TOUCH, WE THOUGHT THAT WE WERE WELL CLEAR AND WE DIDN'T FEEL ANYTHING, BUT I THINK WE'D BETTER HAVE SOMEONE CHECK AS WELL".

The First Officer on the B777 opened the DV window and looked at the right wing (the wing tips are not visible from within the flight deck). He noticed some damage and the Second Officer was sent to view the wing from within the cabin. Once in the cabin his attention was directed by several passengers, who had seen the incident, to damage on the right wing. The Second Officer returned to the flight deck confirming that the aircraft had sustained structural damage. Both the B777 and the B747 taxied back to their respective stands where the damage was inspected.

The weather at the time was bright and sunny with light winds and unlimited visibility. The taxiway surface was dry. The Heathrow ATIS broadcasts transmitted that day and understood by the crew of the B747 all contained the following caution "PILOTS ARE TO EXERCISE CAUTION WHEN MANOEUVRING IN THE RUNWAY HOLDING AREA WING TIP CLEARANCES NOT ASSURED"

The left winglet of the B747-400 had suffered minor damage to its upper edge. A temporary repair was carried out and the aircraft departed a few hours later. The B777 was substantially damaged. The B747's winglet had collided with the trailing edge of the right aileron some 15 feet from the wing tip. The winglet had then passed under the wing lightly scoring the under surface before causing substantial damage to the leading edge slat. The B777 was taken out of service for repair.

### **Previous recommendation (96-43)**

The AAIB investigated a similar accident that occurred on 23 November 1995 between an Airbus A340 and a Boeing 757-236 in the holding area for Runway 27R. As a result of this investigation the AAIB made the following recommendation to the CAA (Recommendation 9643):

'The CAA should in liaison with the appropriate ICAO committees, consider what action may be taken in the longer term to ensure that flight crews of large public transport aircraft are better able to achieve a positive clearance between their aircraft and others while manoeuvring on the ground'.

The CAA accepted this recommendation and advised that:

'It will seek to have this issue raised within ICAO and will draw to the attention of ICAO any particular measures, identified as a consequence of this accident, which might help to minimise problems of this nature. In the mean time the Authority is publishing, early in 1997, a Visual Aids Handbook which will give guidance to pilots on the interpretation of aerodrome visual aids, including taxiway markings'.

The Visual Aids Handbook (CAP 637), referred to in the CAA's response was published in 1997. Section 2 of this document deals with taxiway centreline markings and states that "taxiway centrelines are located so as to provide safe clearance between the largest aircraft that the taxiway is designed to accommodate and fixed objects such as buildings, aircraft stands etc., provided the pilot of the taxiing aircraft keeps their 'cockpit' of the aircraft on the centreline and that aircraft on stand are properly parked".

### **Follow-up action**

As a result of this accident the company operating the B747 has highlighted, in its briefing material for crews operating into Heathrow, the fact that extreme caution is advised when taxiing in some congested areas of the airport as there may be no wingtip clearance between large wingspan aircraft.

The Airport Authority, due to previous ground manoeuvring accidents, has also set up a working group whose objects are to:

- (a) Examine the current daylight, (non Low Visibility Procedure), procedures for runway holding areas,
- (b) Examine whether or not pilots should be given additional guidance within runway holding areas,
- (c) Review the BAA design standards for runway holding areas.

This working group has been tasked to produce recommendations by mid December 1997.

