

ACCIDENTS INVESTIGATION BRANCH
Department of Trade and Industry

**Indian Air Force Super Constellation
BG 579 and Olympic Airways Boeing 727
SX-CBB**

**Report on the circumstances of the
near collision near Heathrow Airport,
London on 9 January 1970**

List of Civil Aircraft Accident Reports issued by AIB in 1971

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Department of Trade and Industry
Accidents Investigation Branch
Shell Mex House
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London WC2

March 1971

The Rt Hon Lord Carrington, KCMG, MC
Secretary of State for Defence

The Rt Hon John Davies MP
Secretary of State for Trade and Industry

Gentlemen,

I have the honour to submit the report by Mr W H Tench, an Inspector of Accidents, on the circumstances of the near collision between Super Constellation BG 579 and Boeing 727 SX-CBB which occurred near Heathrow Airport (London) on 9 January 1970.

I have the honour to be,

Gentlemen,

Your obedient Servant,

V A M HUNT
Chief Inspector of Accidents

Accidents Investigation Branch

Civil Accident Report No EW/E13/01

Aircraft: 1 Lockheed L-1049G Super Constellation No.BG579
Engines: Four Wright R-3350-DA3 Turbo compound
Owner and Operator: Indian Air Force
Pilot: Commander – Squadron Leader
Y S Marwa, IAF – uninjured
Crew: 4 – uninjured
Passengers: 8 – uninjured

Aircraft: 2 Boeing 727-284 registration SX-CBB
Engines: Three Pratt and Whitney JT8D-7
Owner and Operator: Olympic Airways
Pilot: Commander – Captain G Zorbas – uninjured
Crew: 7 – uninjured
Passengers: 21 – uninjured

Place of Incident: Approximately 5 nautical miles NE of Heathrow Airport
Date and Time: 9 January 1970 at 1741 hrs.

All times in this report are GMT

Summary

After becoming too low during a ground controlled approach (GCA) to Runway 26 at Northolt the Super Constellation aircraft was directed to climb and turn to the left to avoid high ground. In the course of the turn, the aircraft passed close to an Olympic Airways Boeing 727 which was making an instrument landing system (ILS) approach to Runway 23L at London Heathrow. There were no casualties or damage and both aircraft subsequently landed safely. The incident was caused by the actions of the GCA controller as a direct result of the failure of the commander of the Super Constellation to follow the talk-down instructions and maintain his assigned height.

1. Investigation

1.1 History of the flights

1.1.1 *Indian Air Force Super Constellation*

This aircraft, callsign VUQLD, was operating a regular courier flight from India to the UK. The flight had originated from New Delhi on 6 January and overnight stops had been made at Bahrain, Beirut and Paris.

The aircraft left Paris on 9 January and flew at FL 80 on Airway Amber 2, arriving over the Lydd VOR at 1700 hrs. The pilot was instructed to hold at Lydd, whereupon a request was immediately made by the aircraft for information about the holding procedure. This was duly passed on by the airways controller. During a 9 minute hold over Lydd the pilot was passed the 1700 hrs Northolt weather. After leaving the holding pattern "LD" requested the R/T frequency to be used by Northolt radar. Airways had not obtained this information before control of the aircraft was handed to London Approach at 1719 hrs.

After leaving Lydd the routing was by way of Biggin VOR and Epsom NDB. Between Biggin and Epsom the pilot was instructed to descend to FL 70 and prepare to hold at Epsom. The aircraft reached Epsom at 1727 hrs and was almost immediately vectored by London Approach radar to a position 12 miles out on final approach for Runway 26 at Northolt and instructed to descend to 1,600 feet QNH.

When London Approach attempted to hand control over to Northolt it became apparent that the aircraft was not equipped with either of the two Northolt GCA primary R/T frequencies, 130.35 MHz and 354 MHz "LD" was identified by Northolt radar and two-way contact was finally established on 123.4 MHz when the aircraft was 10 miles out on final approach. The pilot was then instructed to descend to 1,350 feet on the Northolt QFE of 992 millibars. He was then passed a series of headings in order to track in along the extended runway centreline and intercept the GCA glideslope at about 4 miles from touchdown at 1,350 feet QFE, he was also instructed to check landing gear down and passed the runway length available. Shortly after the aircraft had appeared on the Northolt GCA precision display at a range of about 8 miles, the controller asked "LD" to confirm its height as being 1,350 feet QFE. The reply was "We are 500 feet, sir". The controller immediately instructed the pilot to climb to 1,350 feet. Since the controller was not satisfied from the indications on his elevation display that the aircraft was climbing, some 23 seconds after the first instruction to do so, he again told the pilot to climb. At about this time the controller noticed on his radar that the aircraft was moving to the left of the centreline, whereupon he immediately instructed it to turn to the left in a left hand orbit to keep clear of the hills and continue to climb to 1,500 feet.

The pilot of the Super Constellation has stated that he saw the Northolt runway lights at a range of about 6 miles and that he started a gradual descent in anticipation of receiving descent instructions from the GCA controller. However, he did not tell control that he was leaving the height to which he had been instructed to descend.

The controller made contact with London Approach by telephone about half a minute after he had received acknowledgement from the Super Constellation that it was turning left. The controller, who was alone in the GCA caravan at the time, lost radar contact with the Super Constellation when it moved out of the cover provided by his precision equipment. "LD" reported level at 1,500 feet at 1741 hrs, approximately 90 seconds after the first instruction to climb. At about this time it passed very close to an Olympic Airways Boeing 727 which was carrying out an ILS approach to Runway 23L at Heathrow. Before landing at Northolt, the pilot made a further three GCA approaches, descending on each approach below the height at which he had been instructed to fly.

1.1.2 *Olympic Airways Boeing 727*

This aircraft was operating Olympic flight 257, a direct Athens to London scheduled passenger service. The flight proceeded uneventfully to the Epsom NDB where the aircraft was held for 31 minutes due to other air traffic. On leaving the Epsom pattern, Olympic 257 was vectored by radar for an ILS approach to Runway 23L at Heathrow. Once the pilot had reported established on the ILS of Runway 23L control was handed over to Heathrow Aerodrome Control on 118.2 MHz. As a result when Heathrow director saw the Constellation turn left on his radar and had this turn confirmed from Northolt, he was no longer in contact with Olympic 257 and he had no knowledge of its exact height. To obtain this information he had to contact Heathrow Tower who, in turn, had to ask the aircraft. As soon as it was confirmed that the Boeing was higher than the Constellation, Olympic 257 which was established on the ILS localiser and glideslope, was instructed to climb. Immediately after receiving the instruction and having passed through 1,700 feet QNH, the co-pilot saw an aircraft in the base of the cloud very close on his right hand side, crossing their track at about 90 degrees from right to left. He drew the captain's attention to this aircraft and pulled hard back on the control column, the captain also applied up elevator and increased power on all three engines. The other aircraft passed slightly below and ahead of Olympic 257, sufficiently close for the crew to hear the sound of its engines. ATC then instructed the Boeing to climb to 3,000 feet and started to reposition the aircraft as number five in the landing sequence. However, the pilot announced that he had only five minutes fuel left and the aircraft was given immediate clearance for a landing on Runway 23L. It then landed normally without further incident.

1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
Fatal	—	—	—
Non-Fatal	—	—	—
None	5	8	
	Constellation BG579		
	Boeing SX--CBB		

1.3 Damage to aircraft

There was no damage to either aircraft.

1.4 Other damage

There was no other damage.

1.5 Personnel

1.5.1 *Indian Air Force Super Constellation*

The flight crew of this aircraft consisted of two pilots, a navigator, a signaller and a flight engineer. They were all serving Indian Air Force personnel, qualified on Super Constellation aircraft. The commander, Squadron Leader Y S Marwa, age 37, was a Category 'A' transport pilot with a Master Green Instrument Rating. His most recent categorisation flight check and instrument rating renewal was carried out in September 1969. His total flying experience as a pilot was approximately 4,500 hours, of which 1,500 hours had been in command of Super Constellation aircraft. The subject flight was the first he had made to Northolt at night but he had operated into the airfield seven times previously.

1.5.2 *Olympic Airways Boeing 727*

The flight crew of this aircraft consisted of two pilots and a flight engineer. They were all experienced on the aircraft type and held the appropriate Greek licences.

1.5.3 *Northolt GCA controller*

Flying Officer M J Eaton was the GCA controller on duty at Northolt at the time of the incident. He was trained in ATC procedures at Royal Air Force Shawbury in 1965 and 1966 where he satisfactorily completed the RAF's Joint Air Traffic Control and Radar Approach Control courses. He had been stationed at Northolt for about 3½ years, during which time he had been wholly employed on ATC duties and had carried out several hundred GCA talkdowns. Flying Officer Eaton passed his last proficiency check at Northolt on 25 September 1969. This check was carried out by the RAF ATC Examining Board.

1.6 Aircraft information

1.6.1 *Super Constellation BG 579*

The aircraft had been maintained to Indian Air Force standards. Its weight and centre of gravity were considered to have been within the prescribed limits.

1.6.2 *Boeing 727 SX-CBB*

The aircraft had a valid Greek certificate of airworthiness and a current certificate of maintenance. Its weight and centre of gravity were within the prescribed limits.

1.7 **Meteorological information**

1.7.1 *General weather situation*

In the Heathrow and Northolt area between 1700 and 1800 hrs there were outbreaks of rain and drizzle, moderate at times. There were variable amounts of stratus base 800 to 1,400 feet and eight eighths strato cumulus base 1,600 to 4,000 feet. Above these low clouds there were thick layers of continuous cloud, possibly extending to over 20,000 feet. The surface visibility varied between 4 and 14 kilometres. The freezing level was estimated as being between 5,000 and 6,000 feet precluding any airframe icing at 1,700 feet or below. There was a probability of light to moderate turbulence between 600 and 1,500 feet in the vicinity of Northolt. It is not considered likely that any pronounced down draughts would have been experienced to the NE of Northolt. The incident occurred in darkness.

1.7.2 *Upper winds*

The radio sonde ascent from Crawley which started at 1715 hrs gave upper winds of 199⁰/46 knots at 1,300 feet and 217⁰/46 knots at 2,500 feet.

1.7.3 *Surface observations*

Heathrow 1736 hrs

Surface wind	–	190 ⁰ /18 knots
Weather	–	Moderate rain and drizzle
Visibility	–	6 kilometres
Cloud	–	2/8 stratus base 800 feet 8/8 strato cumulus base 1,600 feet
QNH	–	996.4 millibars

Northolt 1754 hrs

Surface wind	–	190 ⁰ /16 knots
Weather	–	Light rain
Visibility	–	5 kilometres
Cloud	–	4/8 stratus base 1,100 feet 5/8 strato cumulus base 1,300 feet 5/8 strato cumulus base 1,600 feet
QNH	–	996.3 millibars

1.8 Aids to navigation

1.8.1 *Northolt*

The type of GCA in use at Northolt has been in RAF service since 1953. The radar equipment comprised a search and two precision elements (azimuth and elevation). The radar information is presented to the controller on two 12 inch diameter circular cathode ray tubes (CRT) located one above the other, the top tube providing the search radar picture and the lower the separate precision elevation and azimuth displays. The talkdown controller was located in the GCA truck adjacent to the runway, together with the radar equipment and antennae. Facilities were provided in the GCA caravan for two additional controllers when required. The equipment was last flight calibrated in September 1969 and its performance was considered to be satisfactory at that time. On 9 January 1970 the technical staff completed the normal daily inspection and set up the equipment before Northolt was opened for traffic. There was no record of any unserviceability. The controller's log contained no record of equipment malfunction or unserviceability during the course of the day.

The GCA glidepath for Runway 26 was set at 3.5°.

1.8.2 *Heathrow*

ILS localiser and glidepath for Runway 23L were radiating together with the middle marker and MF localiser beacon. The glidepath angle was set at 3°. The outer marker was not in operation due to a fault. Radar surveillance was provided by both 10 cm and 50 cm equipment. PAR was not available for Runway 23L.

1.9 Communications

1.9.1 *Super Constellation BG 579*

The aircraft did not carry either of the two Northolt primary GCA frequencies, ie 130.35 MHz or 354.8 MHz. Communications on other frequencies used were satisfactory.

1.9.2 *Boeing 727 SX-CBB*

Communications on all frequencies used were satisfactory.

1.10 Aerodrome and ground facilities

1.10.1 *Northolt*

Runway 26 was equipped with visual approach slope indicators (VASI) which were set for an approach path of 3.5°.

The runway approach lighting consisted of centreline lights with three cross bars. These lights were high intensity unidirectional white and also incorporated low intensity red omnidirectional lights in the form of a "T". The aerodrome identification beacon was a flashing red light coded "NO".

1.10.2 *Heathrow*

Runway 23L was equipped with VASI set for an approach path of 3.5°.

1.11 **Flight recorder**

1.11.1 *Super Constellation BG 579*

The aircraft was not equipped with a flight recorder.

1.11.2 *Boeing 727 SX-CBB*

This aircraft was fitted with a Fairchild flight data recorder system. The recording medium was engraved aluminium foil. Four parameters were recorded as a function of time: pressure altitude, indicated airspeed, magnetic heading and normal acceleration.

Examination of the refined recorder readout after the appropriate corrections and system calibrations had been applied, revealed that 10 minutes 45 seconds before landing an increment of + 0.6g was applied at an altitude of 1,600 feet on the Heathrow QNH.

1.12 **Significant geographical features – Northolt**

A ridge of high ground runs at approximately right angles to the approach to Runway 26 some 2 to 3 miles from touchdown. The highest point of this ridge is at 408 feet amsl (277 feet above Northolt aerodrome elevation). Situated on the high ground to the north, a little to the right of the extended centreline of Runway 26, is a church, the tip of the spire being 554 feet amsl (423 feet above Northolt aerodrome elevation). The high ground produces a permanent echo on the search display about 1 mile wide (east to west) and 2 miles long (north to south). On the precision displays the permanent echo extends right across the azimuth tube from north to south and is about a mile deep. On the elevation tube a solid permanent echo extends from the baseline to a little over half way to the glidepath, again about a mile wide.

1.13 **Northolt procedures**

Details of ATC procedures to be used at Northolt are contained in the RAF Planning Document. The RAF Terminal Approach Procedure (TAP) chart for Northolt lists the necessary aerodrome information including R/T frequencies, missed approach procedures and significant spot heights. The TAP does not include a profile of the approach to Northolt and some of the print is very small. These documents are used by the Indian Air Force for flight planning and operational use into Northolt. The airways handover procedure laid down in the Northolt TAP specifies that aircraft should be routed via Epsom NDB or Garston VOR under the control of London Approach, until handed over to Northolt GCA.

The missed approach procedure specified that a turn to the north should be made as soon as possible, climbing to 2,000 feet QNH at 500 feet per minute and proceeding to Watford NDB.

The (Civil) *Manual of Air Traffic Control*, Part 3, London Air Traffic Control Instruction (ATCI) No 2, stated that aircraft for Northolt will be routed via Watford NDB or the release point if earlier. For several years aircraft for Northolt have normally been routed via Garston VOR or Epsom NDB. The ATCI does not include procedures from Garston and Epsom for aircraft inbound to Northolt. It stipulates that the handover of aircraft to Northolt GCA is to be made when the aircraft is about 10 miles from touch-down and at 1,500 feet, provided that 1,600 feet is maintained until clear of Alexandria Palace. London approach are instructed to use 119.2 MHz as the marshalling frequency for Northolt aircraft. The Northolt GCA controller can monitor this frequency so as to facilitate the handover.

1.14 Heathrow procedures

At the time of the incident the published ILS procedure for Runway 23L was for localiser only, with the glidepath inoperative. There was, therefore, no obstacle clearance limit specified for an ILS procedure with an operative glidepath. The 23L glidepath had been flight checked on 18 December 1969 and a validation certificate issued. A Certificate of Operation had not been issued, as the glidepath angle was 3° whereas the VASI angle was 3½°. However, technically the 23L ILS glidepath was fully serviceable.

1.15 Tests and research

Due to the unexplained loss of radar contact by the Northolt GCA controller during the first overshoot, it was decided to carry out a series of tests with particular emphasis on targets at 500 feet. By virtue of the built up nature of the approach it was not practicable to make the tests at Northolt. Royal Air Force, Little Rissington, which was equipped with a similar GCA to that available at Northolt was selected as the location for these tests. As a Super Constellation aircraft was not available in the UK, a Lockheed Hercules aircraft was used as a target. It was considered that the radar return of the Hercules would approximate closely enough to that of the Constellation for the purpose of these tests.

The tests showed that at 500 feet QFE the target was visible on elevation and azimuth precision displays during the time the aircraft was within precision cover. During a simulated overshoot manoeuvre the target continued to be visible on the search radar when it had moved out of precision cover. Descent from 1,350 feet QFE at 600 feet per minute down to 500 feet QFE were clearly visible on the precision display.

1.16 Accuracy of time signals

In order to correlate the two R/T recordings, an investigation was made into the accuracy of the time signals injected into the R/T recordings, which revealed that Northolt time signals were 63 seconds slow when compared with the Heathrow signals, and that at the time of the incident the time signals generated at Heathrow were within a few seconds of GMT.

2. Analysis and Conclusions

2.1 Analysis

2.1.1 *Super Constellation BG 579*

The sequence of events which led to the airmiss was initiated by the pilot of the Constellation when he commenced to bring his aircraft down to a height some 850 feet below the height of 1,350 feet (Northolt QFE) assigned to him by ATC. The safe and successful conduct of GCA approaches in particular requires that a pilot should fly the aircraft accurately and closely follow instructions passed to him by the GCA controller.

The action of the commander of the Super Constellation in starting a descent before he was instructed to do so and failing to inform the controller of this departure from the standard procedure was wrong and created a potentially hazardous situation. ATC must be able to assume that when a pilot acknowledges instructions passed to him he will carry them out unless he informs ATC to the contrary.

There is evidence that the pilot also brought his aircraft below his assigned height on each of his subsequent three approaches to Northolt. Failure to comply with ATC instructions on four separate occasions without notifying ATC indicates that the pilot was not sufficiently aware of the importance of establishing a close co-operative operating relationship between pilot and controller if safety and efficiency are to be ensured.

2.1.2 *Northolt GCA controller*

The actions of the controller in relation to the hazard to both aircraft which occurred later must be examined in the light of his responsibilities and the information available to him. The procedures to be followed during a GCA approach are well established and the controller had demonstrated his knowledge of them and his competence in operating the equipment during a regular check carried out during September 1969 by the RAF ATC Examining Board.

The investigation has shown that some of the routine information contained in the procedures was not included in the GCA talkdown of the Super Constellation, but the omissions must be assessed against the time available and the urgency of the operational matters which developed during the approach. Up to the time that the controller changed over to the precision display at about 8 miles from touchdown the aircraft would only have been visible to the controller on his search tube, on which no height information is presented. The pilot had been instructed at the beginning of the GCA approach to fly at 1,350 feet QFE and the controller was entitled to assume that the aircraft would maintain that height within the usual instrument flying tolerances. A deviation of more than 100 feet at this stage could be considered excessive. At a height of 1,350 feet, the interception point of the

GCA glidepath for Runway 26 was about 4 miles from touchdown. With the strong crosswind conditions existing during the approach it was natural that the controller should concentrate on the alignment of the aircraft in azimuth in the initial stages, secure in the knowledge that there were several miles to run before intercepting the glidepath.

With the GCA equipment available at Northolt the presentation of range information is on a logarithmic scale (ie non-linear). Consequently, although the relative displacement of a target aircraft from a fixed datum such as the glidepath can be judged with a high degree of accuracy, absolute height cannot be readily interpreted from the elevation display. Nevertheless, from the tests made at Little Rissington, it was apparent that a steep descent would have been immediately obvious to the GCA controller.

In the event the GCA controller noticed, as the aircraft came into the coverage of his precision display, that it was apparently low on the approach whereupon he took the correct immediate action in instructing the pilot to climb as soon as he had confirmed by R/T that the aircraft was indeed very low. This action may well have prevented a serious accident occurring in a heavily populated area. There was no acknowledgement from the aircraft of the first instruction to climb to 1,350 feet. Some 23 seconds later, during which time the aircraft would have travelled nearly a mile towards the high ground, the GCA controller repeated his urgent instruction to "climb immediately" adding the instruction to make a left hand orbit and continue the climb to 1,500 feet.

With the aircraft 500 feet above Northolt a detailed analysis of the area showed that the aircraft would have been 77 feet above the Harrow-on-the-Hill church spire and 200 feet above the general terrain. Nevertheless, for this stage of the approach the aircraft was far too low.

The controller had been conducting GCA approaches at Northolt for 3½ years and was fully aware of the need to keep Northolt traffic to the north of the airfield. The reason he gave for instructing the pilot to orbit to the left (ie south) was that in his opinion it was the most expeditious way of keeping the aircraft clear of the high ground, particularly as he had observed the aircraft start a turn to the left after his first instruction for it to climb and it had apparently not gained height. In fact, from the evidence of the Heathrow radar controllers coupled with an analysis of the R/T recordings and statements from eyewitnesses, it appears that the Constellation started its orbit to the left about 2 miles from Northolt, that is to say after it had flown over the high ground. Once having instructed the pilot of the Constellation to turn left, there remained a period of only 15 seconds or so during which time the controller could have reversed the direction of turn in order to prevent a conflict with Heathrow traffic landing on Runway 23L. Having instructed the Constellation to turn left it was essential for Heathrow to be informed immediately of his action. In fact, there was a delay of about half a minute between the two events.

For a period of approximately 90 seconds between the time the Constellation reported that it was at 500 feet and the time it reported level at 1,500 feet the controller had no information as to the aircraft's height nor did he ask the pilot for a further report of his height. If, during the 28 seconds which elapsed between his first instruction to climb and his instruction to turn

left, he had obtained confirmation of the aircraft's height, it would then have been apparent to him that the Constellation was clear of the high ground and that a normal missed approach procedure right turn away from the traffic at Heathrow would have been possible.

In any aircraft the best gradient of climb is obtained when climbing straight ahead. Any turns, however small, will cause the climb gradient achieved to be reduced.

The controller was undoubtedly confronted with a highly unusual and potentially dangerous situation when, without informing him, the Constellation pilot descended to a very low height before intercepting the GCA glidepath. However, his action in turning the aircraft to the left in order to try and prevent, in his view, a possible accident in a built-up area caused a serious conflict with Heathrow traffic.

When, through no fault of his own, the controller was presented with alternative courses of action it is considered that he made a bona fide and honest mistake accompanied by no lack of zeal while trying to do his best in the difficult circumstances thrust upon him.

It has not been possible to determine the reason for the loss of radar contact with the Super Constellation during the first overshoot.

Correlation of the Northolt and Heathrow R/T recordings with the flight recorder readout showed that the airmiss occurred at about 1741 hrs about 5 miles north east of Heathrow at an altitude of 1,600 feet on the Heathrow QNH.

2.1.3 *Boeing 727 SX-CBB*

During the overshoot subsequent to the incident, the crew of Olympic 257 declared that they had "fuel only for five minutes". It was later established that in fact the commander meant that they could only wait a further five minutes before making the decision to divert to their specified alternate, Paris (Orly). The amount of fuel remaining on shutdown supported this explanation.

2.1.4 *Heathrow ILS*

The glidepath transmitter for Runway 23L was radiating although there was no current Certificate of Operation, however this did not contribute to the airmiss. The equipment should not have been switched on other than for test purposes until such time as the VASI had been re-set for an approach path of 3°.

2.1.5 *Northolt ATC procedures*

The present procedures for the routeing of aircraft into Northolt have evolved over a period of years. The Heathrow Air Traffic Control Instruction dealing with these routings, however, has apparently not kept up with the actual procedures used by Heathrow ATC. It is desirable that the published ATCI should accurately define the procedures to be used and therefore should be brought up to date so as to include the handover of aircraft to Northolt from both Epsom NDB and Garston VOR.

Northolt has been operating in its present role for some years without a major traffic conflict such as the subject incident occurring. However, due to the close proximity of Northolt and Heathrow a breakdown in the established procedures whether in the air or on the ground can demonstrably produce a serious risk of a mid-air collision.

2.2

Conclusions

(a) Findings

- (i) Both aircraft were serviceable and properly loaded, but the Super Constellation was not equipped with the primary Northolt GCA R/T frequencies.
- (ii) The crew of the Super Constellation were suitably qualified and experienced to carry out the flight. However, the standard of flying displayed by the commander was less than satisfactory.
- (iii) The crew of the Boeing 727 were properly licensed and adequately experienced to carry out the flight.
- (iv) The GCA controller was properly trained and suitably experienced to conduct GCA approaches at Northolt.
- (v) The commander of the Super Constellation descended his aircraft well below the height to which he had been assigned without informing ATC of his intention.
- (vi) The GCA controller's first instruction to the aircraft to climb was both correct and expeditious.
- (vii) When the aircraft started the turn to the left in compliance with the GCA controller's instruction it had already traversed the high ground.
- (viii) The action of the GCA controller in directing the Super Constellation to turn left was wrong as it caused a direct conflict with other aircraft landing on Runway 23L at Heathrow. In the circumstances, the aircraft should have been directed either to climb straight ahead or to climb and turn to the right in accordance with the published missed approach procedure.

(b) Cause

The incident was caused by the GCA controller instructing the Super Constellation to turn left during a climb to avoid high ground. His action was the direct result of the failure of the commander of the Super Constellation to follow the talkdown instructions and maintain his assigned height.

W H TENCH
Inspector of Accidents

Accidents Investigation Branch
Department of Trade and Industry
March 1971