

**Aviation Safety Investigation Report
199602737**

**Lockheed Georgia Co
Hercules
Boeing Co
B737**

01 September 1996

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number:	199602737	Occurrence Type:	Incident
Location:	Brisbane		
State:	QLD	Inv Category:	4
Date:	Sunday 01 September 1996		
Time:	1348 hours	Time Zone	EST
Highest Injury Level:	None		
Aircraft Manufacturer:	Boeing Co		
Aircraft Model:	737-376		
Aircraft Registration:	VH-TAF	Serial Number:	23477
Type of Operation:	Air Transport Domestic High Capacity Passenger Scheduled		
Damage to Aircraft:	Nil		
Departure Point:	Maroochydore QLD		
Departure Time:	1337 EST		
Destination:	Sydney NSW		
Aircraft Manufacturer:	Lockheed Georgia Co		
Aircraft Model:	C-130		
Aircraft Registration:		Serial Number:	
Type of Operation:	Non-commercial Other (including military)		
Damage to Aircraft:	Nil		
Departure Point:	Darwin NT		
Departure Time:			
Destination:	Whenuapai NZ		

Approved for Release: Wednesday, January 1, 1997

FACTUAL INFORMATION

Description of the airspace layout near Brisbane

Controllers are each responsible for pieces of airspace, called sectors. In general, aircraft within each sector were required to have radio communications with the controller responsible for that sector. Airspace involving coastal airways to the north of Brisbane was in sector 3B. Airspace in a similar area to the south of Brisbane was in sector 2G. The boundary between these two sectors was a line between Amberley, Archerfield, Brisbane and the 091 VHF Omni-directional Radio Range (VOR) radial from Brisbane. Sector 4M controlled airspace beyond 30 NM to the east and west of Brisbane, including the Amberley control zone and airspace above. The area up to and including FL200 within 30 NM of Brisbane, excluding the Amberley control zone, lay in the Brisbane Approach area.

History of the Flights

Kiwi 185, a Royal New Zealand Air Force C-130, was tracking from the west of Brisbane to overhead Brisbane and then eastbound along the 089 Brisbane VOR radial at FL290. Its estimated time of arrival overhead Brisbane was 1345 hours local time. When near Brisbane, the aircraft should have been handled by sector 4M until about 20 NM west, then sector 3B until 30 NM east of Brisbane, before being handed back to the sector 4M controller. Because the aircraft would be in sector 3B airspace for only about 50 NM, that controller elected to leave the aircraft on sector 4M's frequency. Due to crossing traffic in a sector to the east of 4M, east of Brisbane, FL290 would not have been available. The aircraft was given a requirement to descend to FL270 before 1400. The sector 4M controller passed this instruction to the aircraft at 1335, after checking with the sector 3B controller and confirming that there were no other requirements for the aircraft. Some time later the sector 4M controller also informed sector 2G that Kiwi 185 had been assigned FL270, with a requirement to reach that level by 1400.

VH-TAF was to track from Maroochydore via TRIKI (32 NM on the 010 radial from Brisbane VOR) to Brisbane and then towards Sydney. The aircraft departed Maroochydore at 1337, on climb to FL350. Initially the aircraft would pass from Maroochydore airspace to sector 3B airspace, however the sector 3B controller had the aircraft call Brisbane Approach instead. After leaving Maroochydore the aircraft should have been handled by sector 3B until 30 NM from Brisbane, when it should have been handed off to Brisbane Approach. If the aircraft then climbed above FL200 before reaching overhead Brisbane it should have been handled again by sector 3B until overhead Brisbane, at which time it would have come under the control of sector 2G. At 1340 the aircraft was at TRIKI, and passing FL130, when the crew called Brisbane Approach. After this time the sector 3B controller discarded the flight strip for this aircraft. The climb performance of the aircraft was such that it was above FL200 before reaching Brisbane, in which case the aircraft should have again been under the control of the sector 3B controller. At 1342 the approach controller noticed the track of Kiwi 185 at FL290 and imposed a climb restriction of FL280 on VH-TAF because of the approach of Kiwi 185. The controller informed the sector 2G controller that the aircraft was being held at FL280 until a stable return was received on Kiwi 185. As the sector 2G controller assumed that the sector 3B controller was separating the two aircraft, and that descent clearance for Kiwi 185 would not be issued until that aircraft was east of Brisbane, the approach controller was not informed that Kiwi 185 was actually assigned FL270.

Kiwi 185 entered the cone of silence overhead Brisbane radar at 1344. The cone of silence is an area above the radar transmitter in which the radar is unable to receive signals from the aircraft. Aircraft in the cone of silence are lost from the radar screen until they are detected on the other side of the cone of silence. VH-TAF entered the cone of silence some 30 seconds after Kiwi 185, shortly before the crew reported approaching FL280. The approach controller held the aircraft at that level until both aircraft had emerged from the cone of silence. Around this time the controller in sector 3B changed. VH-TAF was cleared to climb to FL350 just before 1348, when lateral separation with Kiwi 185 had been achieved. Kiwi 185 commenced descent and reported to the sector 4M controller some 12 seconds after VH-TAF was cleared to climb to FL350.

ANALYSIS

Sector 3B controllers were trained to be aware that some aircraft climbing from Maroochydore can be above approach airspace before passing Brisbane. Their need to check for possible conflicts with traffic overflying Brisbane was, therefore, regular but infrequent. As the controller's attention was normally focussed on the 99% of traffic outside of 30 NM from Brisbane, a positive action to consider traffic inside that distance was required. The two aircraft were the responsibility of this controller overhead Brisbane but the controller did not recognise the conflict. After VH-TAF had entered Brisbane Approach's airspace, the sector 3B controller discarded the flight strip for that aircraft. It was evident that the controller had not considered the possibility of VH-TAF re-entering sector 3B airspace before reaching Brisbane, nor had the possibility of a conflict with Kiwi 185 been considered. In addition, the controller had not identified Kiwi 185 to sector 2G, nor informed the sector 2G controller of the descent requirement for Kiwi 185. That information was ultimately relayed by the sector 4M controller.

The Approach controller had noticed that VH-TAF and Kiwi 185 would conflict, so took steps to ensure vertical separation between the two aircraft. Both aircraft were outside the Approach controller's area of responsibility. Co-ordination was conducted with the sector 2G controller after this action was taken, but that controller did not mention the descent requirement for Kiwi 185. As a result, the Approach controller was not aware that Kiwi 185 could have initiated a descent at any time. Such a descent would have caused a breakdown in separation standards between the two aircraft. Fortunately, the descent did not take place until other separation standards had been obtained.

The sector 2G controller was aware of both aircraft and the conflict, but assumed that the sector 3B controller was providing the separation. This aspect was not positively checked with the other controller, nor did the sector 2G controller warn the Approach controller that Kiwi 185 might descend at any time.

Both aircraft were on different radio frequencies so the crews would not have been aware of each other through radio transmissions.

SIGNIFICANT FACTORS

1. Controllers did not ensure that aircraft were operating on radio frequencies relevant to the airspace in which they were flying.
2. The sector 3B controller did not ensure separation for all aircraft in the sector.
3. The sector 3B controller did not maintain a flight strip to cover the full period for which VH-TAF was in the sector.
4. The sector 2G controller assumed that the sector 3B controller was ensuring separation for traffic near the boundary of both sectors.
5. Co-ordination between controllers was inadequate.

SAFETY ACTION



As a result of this incident, Airservices Australia Northern District management have recommended the following actions:

1. That aircraft contact the responsible sector for clearance to levels above approach airspace. Such aircraft would be held in approach airspace (maximum FL200) until handed off to the responsible sector. This would provide positive separation to overflying traffic.
2. A review of the terminal area altitude cap (FL200).
3. That the need to retain flight progress strips until an aircraft is clear of a sector's responsibility be reiterated.

