



Australian Government

Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Aviation Occurrence Report – 200600395

Final

**Breakdown of co-ordination – 13 km north-east of
Melbourne Airport – 25 January 2006**

VH-VQQ

Airbus A320-232

VH-MWQ

Beech Aircraft Corporation 200 - King Air



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Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office location: 15 Mort Street, Canberra City, Australian Capital Territory
Telephone: 1800 621 372; from overseas + 61 2 6274 6590
Accident and serious incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6274 6474; from overseas + 61 2 6274 6474
E-mail: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

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ISBN and formal report title: see 'Document retrieval information' on page iii.

DOCUMENT RETRIEVAL INFORMATION

Report No.	Publication date	No. of pages	ISBN
200600395	5 March 2007	11	1 922164 46 8

Publication title

Breakdown of Coordination – 13 km north-east of Melbourne Airport – 25 January 2006 – VH-VQQ, Airbus A320-232 – VH-MWQ, Beech Aircraft Corporation 200 – King Air

Prepared by

Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608 Australia
www.atsb.gov.au

Acknowledgements

Figure 1 is an extract from the Melbourne terminal control unit local instructions. The chart is copyright of Airservices Australia.

Abstract

On 25 January 2006 a Beech Aircraft Corporation 200 (King Air) aircraft was north bound en route from Essendon, Vic., to Shepparton, Vic. The aircraft was operating under the instrument flight rules (IFR) and was climbing to flight level (FL) 130. At the same time, an Airbus A320-232 (A320) aircraft was south-west bound en route from Sydney, NSW, to Avalon, Vic., and was on descent to FL130. The aircraft were in airspace that was being managed by the Melbourne Departures North controller (north controller). The King Air pilots were communicating with air traffic control on the Melbourne Departures South frequency. The A320 pilots were communicating with air traffic control on the Melbourne Approach East controller's (east controller's) frequency.

When the aircraft were about 10 NM east of Melbourne at FL130, Melbourne air traffic controllers realised that a potential for an infringement of separation existed and a short term conflict alert activated on their air situation displays. The controllers issued turn instructions to the crews of each aircraft, which preserved the required 3 NM radar separation minima. The east controller also issued traffic information on the King Air to the crew of the A320. A review of the recorded radar data showed that the two aircraft came within about 4 NM of each other.

Although there was no infringement of separation standards, the controllers concerned were not aware that a potential conflict existed between the two aircraft until avoiding action, initiated by air traffic control, was required in order to preserve the 3 NM radar separation standard. There was a breakdown in coordination between the east controller, the north controller and the south controller.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. ATSB investigations are independent of regulatory, operator or other external bodies.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances in order to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

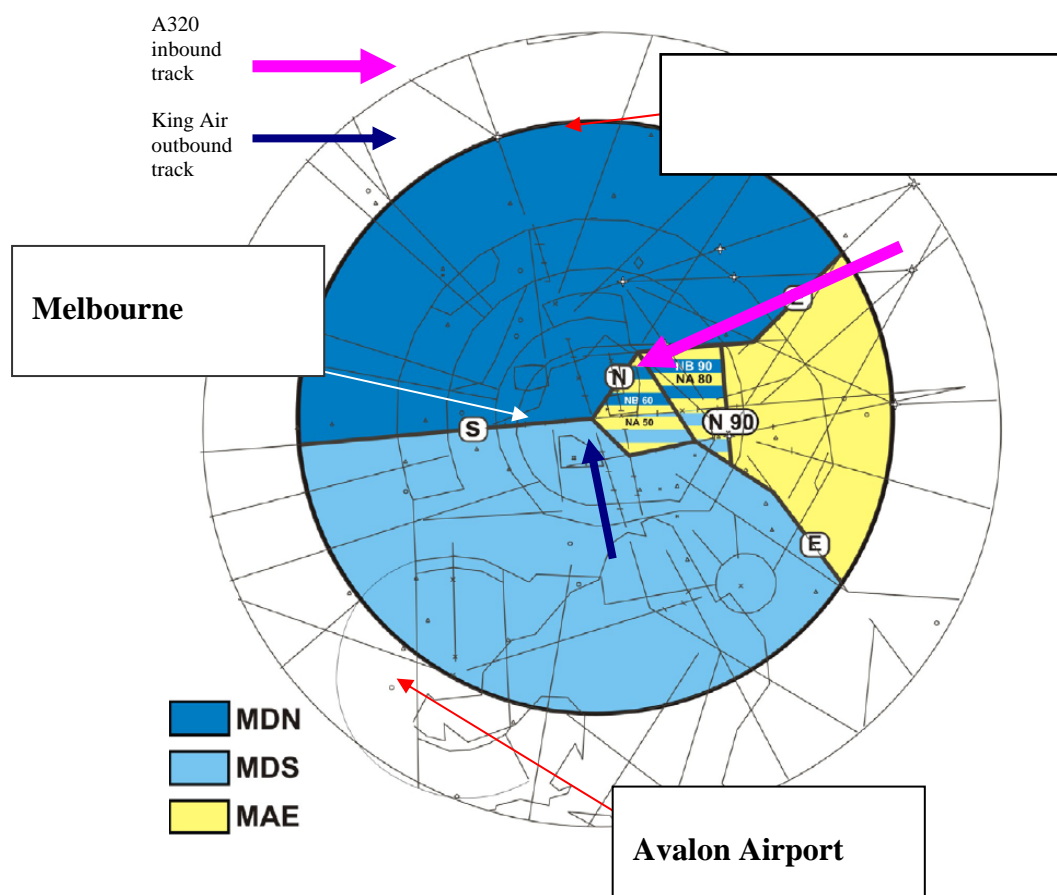
Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau prefers to report positive safety action in its final reports rather than making formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail in consultation with the industry).

FACTUAL INFORMATION

On 25 January 2006 a Beech Aircraft Corporation 200 (King Air) aircraft, registered VH-MWQ, was north bound en route from Essendon Airport, Vic., to Shepparton, Vic. The aircraft was being operated under the instrument flight rules (IFR) and was climbing to flight level (FL) 130. At the same time, an Airbus A320-232 (A320) aircraft, registered VH-VQQ, was south-west bound en route from Sydney, NSW, to Avalon, Vic., via overhead Melbourne Airport and was on descent to FL130. The two aircraft were in airspace that was being managed by the Melbourne Departures North controller (north controller) (see terminal airspace configuration – figure 1¹). The pilot of the King Air was communicating with air traffic control on the Melbourne Departures South (south controller) frequency. The pilots of the A320 were communicating with air traffic control on the Melbourne Approach East (east controller) frequency.

Figure 1: Melbourne Runway 27 terminal airspace configuration²



- 1 Note that Departures North and Departures South airspace overlies part of Approach East airspace to the east of Melbourne Airport.
- 2 MDN – Melbourne departures north
MDS – Melbourne departures south
MAE – Melbourne approach east.

At 1754:31 Eastern Daylight-saving Time³, when the aircraft were about 10 NM east of Melbourne, both the east and south controllers realised that a potential for an infringement of separation existed, and a short term conflict alert activated on their air situation displays (ASDs). Both controllers issued turn instructions to the pilots of each aircraft, which preserved the required 3 NM radar separation minima⁴, when the aircraft were about 6 NM north-east of Melbourne. The east controller also issued traffic information to the pilots of the A320 about the King Air. There had been a breakdown in coordination between the controllers.

At 1748:02, the south controller advised the north controller that the King Air was departing from runway 17 at Essendon. Once the aircraft left the Essendon airspace, it entered the south controller's airspace before it entered the north controller's airspace. The south controller ensured that the King Air did not enter the east controller's airspace. That eliminated the need for the south controller to provide information to the east controller about the King Air, and reduced the workload of both controllers. It also reduced the workload of the pilot of the King Air by eliminating two intermediate radio frequency changes.

At 1748:52, an en route sector controller advised the east controller of the location of the A320 and that the pilots had been cleared to descend their aircraft to FL150. At 1752:34, the east controller advised the north controller about the location and assigned altitude of the A320. The east controller then cleared the pilots of the A320 to descend to FL130. The north controller advised the east controller that the A320 could continue to descend below FL130 in north airspace. The north controller later reported that the approval for the A320 to descend to FL130 was an oversight because the King Air was a restriction for the A320, once the A320 descended below FL140.

At 1753:45, the east controller advised the south controller about the location of the A320 and that it would be on descent to 10,000 ft. The south controller advised the east controller that the A320 could continue descent below FL130.

The south controller intended to transfer control of the King Air to the north controller once the King Air entered the north controller's airspace, to the east of Melbourne Airport. However, the south controller was distracted by separation and other tasks, and did not transfer control of the King Air to the north controller.

The north and south controllers were aware of both the A320 and the King Air. Despite that awareness, neither notified the east controller that the King Air was a restriction for the descent of the A320. The east controller was not aware of the location and intentions of the King Air and, as that aircraft had climbed above east airspace, the east controller would not normally have a requirement to be notified about that aircraft.

The Manual of Air Traffic Services (MATS)⁵ required the east controller to notify both the north and south controllers about the location and intentions of the A320 'Prior to [either] 20 miles of the sector boundary; or the distance specified in Local Instructions'. As there was no distance specified in local instructions in this case, the east controller was required to notify both the north and south controllers about the location and intentions of the A320 at least 20 NM prior to the aircraft reaching the boundaries of their respective airspaces. Although the

³ The 24-hour clock is used in this report to describe the local time of day, Eastern Daylight-saving Time, as particular events occurred. Eastern Daylight-saving Time was Coordinated Universal Time (UTC) + 11 hours.

⁴ A review of recorded radar data showed that the two aircraft came within about 4 NM of each other.

⁵ MATS part 6, section 5, p. 6-52 effective 05 November 2005.

east controller notified both the north and the south controllers about the A320, that notification was not in accordance with the requirements of the MATS.

The south controller later reported that all three control positions, north, east and south, had quickly become very busy. A departing aircraft had occupied runway 27 at Melbourne Airport, which was the runway in use, but was unable to depart because the wind direction had changed and created a downwind component on that runway. That, in turn, required significant work on the part of the approach and departures controllers to re-sequence arriving aircraft that could not land on runway 27 until the aircraft had vacated that runway.

Approach and departure airspace extended to a radius of 30 NM from Melbourne Airport at various altitudes. It was divided into north, south and east sectors. The dimensions of those sectors of airspace varied depending on the runway in use. At the time of the occurrence, the airspace was configured for runway 27 operations (figure 1). Based on its planned track and expected descent profile through the airspace, the A320 would have transited the east and north airspace before entering the south airspace en route to Avalon Airport, once it passed overhead Melbourne Airport.

The Australian Advanced Air Traffic System (TAAATS) allocated colours to aircraft track symbols and associated data blocks that were displayed on the controller's ASD. Those colours indicated the relevance of an aircraft to a particular controller. An Airservices Australia report into the occurrence stated that, prior to voice coordination from the east controller, the colour of the track symbol and data block of the A320 on the north and south controllers' ASDs was black. The report also stated that, prior to the activation of the short term conflict alert, the King Air's track symbol and associated data block were also black on the east controller's ASD. That indicated that the aircraft was not relevant to the east controller.

In relation to the provision of aircraft separation, MATS 4.1.1.4 stated that:

Tactical Separation Assurance places greater emphasis on traffic planning and conflict avoidance rather than conflict resolution. This is achieved through:

- a. the proactive application of separation standards to avoid rather than resolve conflicts;
- b. planning traffic to guarantee rather than achieve separation;
- c. executing the plan so as to guarantee separation; and
- d. monitoring the situation to ensure that plan and execution are effective.

ANALYSIS

None of the controllers involved in the occurrence detected that a potential conflict existed between the A320 and the King Air, before being alerted by a short term conflict alert. Following that alert, the controllers were able to initiate avoiding action to ensure that separation was not infringed. This analysis examines those factors that may have contributed to the occurrence, and highlights the safety issues that became evident as a result of the investigation.

The Melbourne Departures North controller (north controller) was responsible for separating the King Air with the A320 while those aircraft were in north airspace. At the time of the occurrence, neither aircraft was on the north controller's radio frequency. In the event, the north controller overlooked the King Air as a restriction on descent for the A320.

Had the Melbourne Departures South controller (south controller) instructed the pilots of the King Air to contact the north controller, and had they done so, the north controller's attention may have been drawn to the location of the King Air relative to the A320. He may then have been able to coordinate an appropriate altitude for the A320 with the Melbourne Approach East Controller (east controller) that would have demonstrated 'the proactive application of separation standards to avoid rather than resolve conflicts' in accordance with the Manual of Air Traffic Services.

The situational awareness of all controllers may have been affected by the:

- increased workload resulting from the requirement to re-sequence arriving aircraft due to changing weather conditions in the area
- black A320 track presentation on the north controller's air situation display
- east controller not correctly coordinating the location and intentions of the A320 to either the north or the south controller

The timely and concise instructions issued by both the south and east controllers to the pilots of each aircraft ensured that the 3 NM radar separation standard was not infringed.

SAFETY ACTIONS

Airservices Australia

As a result of this occurrence, Airservices Australia incorporated a change to The Australia Advanced Air Traffic System software so that all inbound jet aircraft to Avalon are now presented as blue track symbols on the approach radar air situation display (ASD). Aircraft displayed with a blue track symbol announce to the controller that the aircraft is inbound. That should improve controller awareness of aircraft that overfly Melbourne Airport from the north-east and inbound to Avalon Airport.

In addition, Melbourne Operations has issued a Local Instruction requiring that the Melbourne Approach East controller (east controller) pass radar derived position information on all jet traffic inbound to Avalon from the north-east of Melbourne to, and coordinate a descent level with, both the Melbourne Departures North and South controllers by 30 NM north-east of Melbourne.

Airservices Australia also:

- mandated that controllers display an Avalon arrivals window on ASDs so that those aircraft that are arriving at Avalon Airport are highlighted to the controllers concerned
- instructed the flow controller and/or the operations supervisor on duty to make the east controller aware of traffic inbound to Avalon from the north-east of Melbourne airport
- established an Avalon Procedures Committee.