Australian Government
Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Aviation Occurrence Report – 200604222

Final

Airprox – Orange, NSW – 23 June 2006

VH-UZO

Beechcraft Aircraft Corp Baron

VH-SBA

SAAB Aircraft AB SF-340B

Australian Government

Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Aviation Occurrence Report
200604222

Final

Airprox – Orange, NSW – 23 June 2006
VH-UZO
Beechcraft Aircraft Corp Baron
VH-SBA
SAAB Aircraft AB SF-340B

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 6130
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6274 6474; from overseas + 61 2 6274 6130
E-mail: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

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

DOCUMENT RETRIEVAL INFORMATION

Report No.	Publication date	No. of pages	ISBN
200604222	29 May 2007	9	978-1-921164-76-7

Publication title

Airprox - Orange, NSW - 23 June 2006, VH-UZO, Beechcraft Aircraft Corp Baron – VH-SBA, SAAB Aircraft AB SF-340B

Prepared by

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

Reference No.

May2007/DOTARS 50236

Abstract

On 23 June 2006 at about 1730 Eastern Standard Time, a Beech Aircraft Corp 58 (Baron) was conducting a global positioning system (GPS) arrival procedure for arrival at Orange Aerodrome, NSW. The aircraft was approaching the aerodrome from the west. At the same time, a SAAB Aircraft AB SF-340B (SAAB) was conducting an Orange runway 29 straight-in area navigation global navigation satellite system (RNAV GNSS) approach. The two aircraft had the same estimated time of arrival at Orange Aerodrome. They were both being operated under the instrument flight rules, and were in instrument meteorological conditions.

At the missed approach point of the GPS arrival procedure, and at an altitude of 4,220 ft, the pilot of the Baron had not become visual with the aerodrome. He commenced the published missed approach procedure and made a transmission on the Orange common traffic advisory frequency (CTAF) to advise local traffic that he was conducting that procedure. That required the pilot to track a bearing of 098 degrees magnetic from the Orange non-directional beacon and to climb the Baron to the minimum sector altitude of 5,200 ft above mean sea level.

The captain of the SAAB advised the pilot of the Baron that, in order to maintain separation, the pilot of the Baron would have to manoeuvre his aircraft. The pilot of the Baron manoeuvred his aircraft accordingly.

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

History of the flight

On 23 June 2006 at about 1730 Eastern Standard Time, the pilot of a Beechcraft Aircraft Corp 58 (Baron) was conducting a Cudal to Orange global positioning system arrival (GPS arrival) procedure for arrival at Orange Aerodrome, NSW. The aircraft was approaching the aerodrome from the west. At the same time, the crew of a SAAB Aircraft AB SF-340B (SAAB) was conducting an Orange runway 29 straight-in area navigation global navigation satellite system (RNAV GNSS) approach. The two aircraft were being operated under the instrument flight rules (IFR), and were in instrument meteorological conditions (IMC). The pilots of the two aircraft were operating on the Orange common traffic advisory frequency (CTAF) and were communicating with each other in accordance with the published procedures for application in class G airspace in the vicinity of an aerodrome. That included making those radio broadcasts that were necessary in support of their respective instrument approaches and for self-separation.

The Baron was tracking 098 degrees magnetic towards the non-directional beacon (NDB) that was located at the aerodrome. At the final approach fix (FAF) of the GPS arrival, which was at 6 NM from the aerodrome, the pilot of the Baron advised the pilot of the SAAB that, once visual, he would position the Baron on the left downwind leg for runway 29 in order to land after the SAAB. The pilot of the Baron reported that his expectation of becoming visual prior to reaching the minimum descent altitude for the GPS arrival was based on his assessment of the weather information used to plan the flight, and his knowledge of the local area.

When the SAAB was at about the 10 NM point on the RNAV GNSS approach, and tracking inbound on 294 degrees magnetic, the approximate position and altitude of the Baron was displayed on the SAAB's traffic alert and collision avoidance system (TCAS). The Aeronautical Information Publication (AIP) GENERAL GEN 1.5 section 7 expects that pilots will react to TCAS alerts as follows:

- in response to a traffic advisory (TA) alert, the pilot will attempt to establish visual contact with the other traffic and to change the aircraft's flight path only if it is established that there is a risk of a collision
- a resolution advisory (RA) alert requires the pilot to respond as directed by the TCAS system.

At the missed approach point (MAPt) of the GPS arrival procedure, and at an altitude of 4,220 ft above mean sea level (AMSL), the pilot of the Baron had not become visual with the aerodrome as planned. He commenced the published missed approach procedure and advised the local traffic to that effect on the CTAF. The missed approach procedure required the pilot to track from overhead the NDB on a course of 098 degrees magnetic, and to climb to the minimum sector altitude (MSA) of 5,200 ft.

The pilot in command of the SAAB reported that, when passing the FAF for the RNAV GNSS approach, the TCAS indicated that the Baron was at 5 to 6 NM ahead of the aircraft. As a result, the crew of the SAAB requested an indication of the Baron's altitude, to which the pilot of the Baron replied that he was passing 4,500

ft. The pilot in command of the SAAB advised the pilot of the Baron that, in order to maintain separation, the pilot of the Baron would have to manoeuvre his aircraft.

In response, the pilot of the Baron turned his aircraft to the right and off the published missed approach procedure, reaching 5,200 ft shortly thereafter. The pilot of the Baron indicated that the right turn was as a result of his previous training, including the conduct of a right turn in order to avoid conflicting traffic. That was also consistent with the collision avoidance requirements of Civil Aviation Regulation 162 (2). The pilot in command of the SAAB reported that:

- the minimum distance between the two aircraft that was displayed on the TCAS was between 500 and 1,200 ft vertically, and 3 to 4 NM horizontally
- neither a TCAS TA nor RA was received on the Baron.

The SAAB continued the runway 29 straight-in RNAV GNSS approach and landed. The pilot of the Baron conducted an NDB approach procedure and landed on runway 29.

The crews of both aircraft reported that neither had considered their self-separation requirements if they or the other aircraft were required to conduct a missed approach.

Operational information

The airspace below 8,500 ft in the vicinity of Orange Aerodrome was class G airspace. In accordance with the National Airspace System (NAS), aircraft operating under the IFR in class G airspace were entitled to receive traffic information from air traffic control (ATC) on other relevant IFR aircraft to assist in their self-separation. The pilots of both aircraft confirmed that they received mutual traffic information from ATC when they were inbound to the aerodrome in accordance with published procedures.

Pilots conducting instrument approaches to aerodromes such as Orange were expected to comply with the descent requirements of paragraphs 1.4 and 1.5 of section ENROUTE ENR 1.5 of the AIP. In this instance, that meant that both pilots were required to comply with the requirements of their respective instrument approach procedures. That included the conduct of the missed approach by the pilot of the Baron.

ANALYSIS

The airspace in the vicinity of Orange Aerodrome was structured in accordance with the National Airspace System (NAS). In addition, the provision of mutual traffic information by air traffic control to the pilots of both aircraft was in accordance with the requirements of the Manual of Air Traffic Services (MATS).

The pilots of both aircraft complied with the published common traffic advisory frequency (CTAF) communications procedures applicable to their respective approaches to Orange Aerodrome. However, the efficacy of those procedures in this case was diminished by the fact that neither pilot considered the risk of their not becoming visual from their respective instrument approaches, requiring the conduct of a missed approach.

The request by the pilot in command of the SAAB for the pilot of the Baron to manoeuvre his aircraft was a proactive attempt to minimise any possibility of a potential for conflict with his own aircraft. It was probable that that action, together with the fact that the pilot of the Baron was already established in the climb, maximised the minimum distance and height between the two aircraft as the pilot of the Baron manoeuvred. The result was the non-activation of any traffic or resolution advisory alerts on the SAAB's traffic alert and collision avoidance system (TCAS).

The Baron pilot's instinctive decision to turn right resulted in the deviation of his aircraft from the published missed approach track. However, that decision was probably influenced by the perception that the captain of the SAAB might have identified the Baron on his TCAS as being too close, and by the approaching missed approach altitude. Had the pilot in command of the SAAB had time to relay elements of his TCAS-derived traffic information to the pilot of the Baron, the right turn may not have been made. In the event, the pilot of the Baron did not have sufficient information to determine the most appropriate course of action in the circumstances, and turned towards the SAAB.

This incident highlights the benefits for pilots of the adherence to published CTAF procedures, and the need for pilots to consider their self-separation requirements if required to carry out a missed approach. In addition, the utility of TCAS equipment, particularly when in instrument meteorological conditions (IMC), was emphasised.

FINDINGS

Contributing safety factors

- Neither flight crew considered their self-separation requirements if they or the other aircraft were required to conduct a missed approach.

Other key findings

- The airspace in the vicinity of Orange was structured in accordance with the National Airspace System (NAS).
- The provision of mutual traffic information by air traffic control to the pilots of both aircraft was in accordance with the requirements of the Manual of Air Traffic Services (MATS).
- The flight crews of both aircraft complied with the published common traffic advisory frequency (CTAF) communication procedures.