Australian Government
Australian Transport Safety Bureau

Collision on runway between a Grob G103 Twin Astir glider, VH-UIZ and a Cessna 150F, VH-ROZ

Tocumwal Aerodrome, NSW on 9 March 2013

ATSB Transport Safety Report
Aviation Occurrence Investigation
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Addendum

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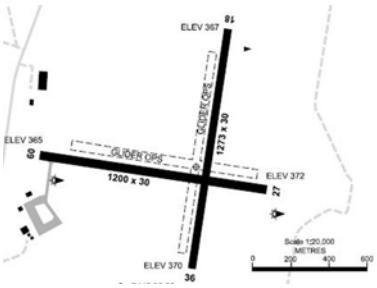
What happened

Tocumwal Aerodrome



Source: Airservices Australia

On 9 March 2013, two glider clubs were conducting gliding operations at the same time as an aerobatic aircraft event was being conducted at Tocumwal aerodrome, New South Wales. The gliders and glider tug aircraft were operating left circuits from the grass runway 36 left (36L) and the aircraft involved in the aerobatic event were operating right circuits from runway 36 right (36R), the sealed runway. Once airborne, the gliders were being towed to the west of the aerodrome prior to release, to remain clear of the aerobatic aircraft. The aerobatic activity was being conducted in a 'box' directly overhead the aerodrome down to 1,200 ft above mean sea level.

A 'Tocumwal Advisory' radio service was being provided to the aerobatic aircraft by a ground station transmitting on the Tocumwal Common Traffic Advisory Frequency (CTAF). The constant radio traffic generated on the CTAF by the Tocumwal Advisory service, the aerobatic aircraft, gliders and glider tug aircraft meant that the radio frequency was more congested than normal at Tocumwal.

At 1313 Eastern Daylight-saving Time[1], a Grob G103 Twin Astir glider, registered VH-UIZ (UIZ), was towed airborne for a solo flight to the west of the aerodrome and released at 2,000 ft. The pilot of UIZ heard the CTAF broadcasts made by the glider tug pilot, as the tug rejoined the circuit and landed. After a number of orbits looking for rising air, the pilot of UIZ tracked to return to the circuit and land.

At 1316, a Cessna 150F (C150), registered VH-ROZ (ROZ), became airborne towing a glider and tracked to the west prior to releasing the glider at 1,700 ft for a cross-country flight. ROZ and this glider were from one gliding club, UIZ from the other. Following the release, the pilot of ROZ turned left and tracked for a left downwind for runway 36L, making all necessary CTAF broadcasts.

The pilot of UIZ heard the downwind CTAF broadcast made by the pilot of ROZ, but did not recall hearing any other broadcasts from that aircraft.

The pilot of ROZ made the required CTAF broadcast, just prior to turning the aircraft onto the base leg of the circuit, at about 1,000 ft, and while doing about 65 to 70 knots. As he completed the turn, he reported hearing a poor quality broadcast from an aircraft on downwind. As all the broadcasts he had heard from Tocumwal Advisory and the aerobatic aircraft had been loud and clear, he determined that the call he had just heard was from a glider on left downwind, which was well behind him.

The pilot of UIZ had joined downwind for runway 36L, abeam the upwind threshold at about 1,300 ft, doing between 55 and 60 knots, when he made the required CTAF broadcast. As he was 100 ft lower than the standard height on downwind, the pilot of UIZ was very conscious of the need to expedite the landing.

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[1] Eastern Daylight-saving Time (EDT) was Coordinated Universal Time (UTC) + 11 hours.

The subsequent sequence of events could not be determined, as neither aircraft heard the CTAF broadcasts from the other. However, witnesses on the ground reported hearing both pilots making all necessary CTAF broadcasts.

The pilot of ROZ reported seeing no other aircraft or any gliders while in the circuit. The pilot of UIZ reported seeing only one aircraft while in the circuit, well to the south of the aerodrome when UIZ was on left base. The pilot of UIZ was not able to determine the direction of travel of that aircraft due to the need to focus on landing the glider.

At 1326, just as ROZ touched down on runway 36L, the pilot felt a heavy jolt on the top of the cockpit and simultaneously heard a loud noise. Immediately, he saw the windscreen fill with the underside of a glider. He observed the glider continue down the runway at about 5 to 10 ft above ground level. As soon as the aircraft came to a stop, the pilot of ROZ turned off the runway and did not see the glider land. The pilot was uninjured and, on exiting the aircraft, observed a wheel contact print on the top of the aircraft.

The pilot of UIZ was uninjured and landed the glider well down the runway. Although UIZ was fitted with a FLARM[2] collision warning system, no alarm was triggered, as the tug aircraft was not fitted with a similar FLARM system. On exiting the glider, the pilot observed damage on the left wing and fuselage. However, he was not aware that he had landed on the tug aircraft until club personnel arrived in an airfield vehicle.

Both gliding clubs operated with a radio-equipped observer on the ground, known as the 'duty pilot', to record glider departure and arrival times and to observe operations. Though both duty pilots observed the latter stages of the accident sequence, they were engaged in other activities remote from the radios.

Gliding Federation of Australia

Both gliding clubs operated under the rules and procedures proscribed by the Gliding Federation of Australia (GFA). The investigation conducted by the GFA determined that glider and tug landed together with the glider on top. Propeller strikes caused damage to the underside of the glider's left wing and along the fuselage near the main landing wheel (Figure 1). There was no damage to the C150.

The GFA investigation determined that the glider tug and glider would have been operating at similar speeds, on simultaneous final approach aiming to land on the same runway, using a similar aiming point. The restricted visibility from both cockpits would have resulted in neither pilot being aware of the other.

The GFA investigation also noted:

> While the pilot of both aircraft made appropriate broadcasts on the CTAF, it is possible the radio transmissions tug to glider were not heard due to proximity interference. Frequency congestion from the aerobatic operations may also have impeded situational awareness.

[2] The FLARM, from 'flight alarm', collision warning system activates when another FLARM system is detected within a predetermined proximity. The FLARM system fitted to UIZ would have provided an audible alarm only, with no directional or distance information.

Figure 1: Damage to VH-UIZ

Source: Operator

ATSB comment

The poor quality of UIZ's downwind CTAF broadcast as heard by the pilot of ROZ, and the fact the neither pilot heard any other broadcasts from the other during the unfolding incident, may have been a result of radio receiver dynamic range performance. The sensitivity of a radio receiver can easily be overloaded when strong signals are present, for example when the transmitting radio is very close to the receiving radio.

Safety actions

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety actions in response to this occurrence.

Gliding Federation of Australia

As a result of this occurrence, the GFA has advised the ATSB that they will raise awareness of collision risk at non-towered aerodromes with its members through the Gliding Magazine and through its biennial Safety Seminars.

Glider tug operator

As a result of this occurrence, the operator of the glider tug has advised the ATSB that they are sourcing quotes for the fitment of FLARM to their gliders and glider tug aircraft.

Safety message

When operating outside controlled airspace, it is the pilot's responsibility to maintain separation with other aircraft. For this, it is important that pilots utilise both alerted and unalerted see-and-avoid principles. Pilots should never assume that an absence of traffic broadcasts means an absence of traffic.

Issues associated with unalerted see-and-avoid have been documented in an ATSB research report *Limitation of the See-and-Avoid Principle*. Unalerted see-and-avoid relies entirely on the

ability of the pilot to sight other aircraft. A traffic search in the absence of traffic information is less likely to be successful than a search where traffic information has been provided because knowing where to look greatly increases the chance of sighting the traffic.

The Civil Aviation Safety Authority (CASA) has published a number of Civil Aviation Advisory Publications (CAAPs) dealing with operations at non-towered aerodromes and the importance of not relying solely on radio broadcasts for traffic advice.

The following publications provide useful information on radio use and the limitations of see-and-avoid.

- Civil Aviation Advisory Publication 166-1(0) – *Operations in the vicinity of non-towered (noncontrolled) aerodromes* is available at casa.gov.au/wcmswr/_assets/main/download/caaps/ops/166-1.pdf
- Civil Aviation Advisory Publication 166-2(0) – *Pilots' responsibility for collision avoidance in the vicinity of non-towered (non-controlled) aerodromes using 'see-and-avoid'* is available at casa.gov.au/wcmswr/_assets/main/download/caaps/ops/166-2.pdf
- Civil Aviation Advisory Publication 5-59(1) – *Teaching and Assessing Single-Pilot Human Factors and Threat and Error Management* is available at casa.gov.au/wcmswr/_assets/main/download/caaps/ops/5_59_1.pdf
- *Limitations of the see-and-avoid principle* (1991) is available at www.atsb.gov.au/publications/2009/see-and-avoid.aspx
- *A pilot's guide to staying safe in the vicinity of non-towered aerodromes* (AR-2008-004(1)) is available at www.atsb.gov.au/publications/2008/ar-2008-044(1).aspx
- *Pilots' role in collision avoidance* (Federal Aviation Administration Advisory Circular AC 90-48C) is available at rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%2090-48C/$FILE/AC90-48c.pdf
- *Collision avoidance strategies and tactics* is available at www.aopa.org/asf/publications/sa15.pdf
- A Flight Safety Australia article, *Sharing the skies – gliders* printed in Issue 87 July-August 2012, is available at: www.flightsafetyaustralia.aero/#folio=1

More information on radio receiver dynamic range performance is available at www.radio-electronics.com/info/receivers/dynamic_range/dynamic_range.php

General details

Occurrence details

Primary occurrence type:	Collision on ground	
Occurrence category:	Accident	
Location:	Tocumwal Aerodrome, NSW	
	Latitude: 35° 48.65' S	Longitude: 145° 36.25' E

Grob G103 Twin Astir glider

Manufacturer and model:	Grob – Burkaart Flugzeugbau – Twin Astir G103	
Registration:	VH-UIZ	
Type of operation:	Gliding	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Cessna 150

Manufacturer and model:	Cessna Aircraft Company 150F	
Registration:	VH-ROZ	
Type of operation:	Sports aviation	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

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.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. 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.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.