

Australian Government Australian Transport Safety Bureau

Electrical system event involving a Cirrus SR22T, VH-LBQ

near Kingaroy, Queensland, 5 August 2013

ATSB Transport Safety Report Aviation Occurrence Investigation AO-2013-126 Final – 25 February 2014 Released in accordance with section 25 of the Transport Safety Investigation Act 2003

Publishing information

Published by:	Australian Transport Safety Bureau
Postal address:	PO Box 967, Civic Square ACT 2608
Office:	62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone:	1800 020 616, from overseas +61 2 6257 4150 (24 hours)
	Accident and incident notification: 1800 011 034 (24 hours)
Facsimile:	02 6247 3117, from overseas +61 2 6247 3117
Email:	atsbinfo@atsb.gov.au
Internet:	www.atsb.gov.au

© Commonwealth of Australia 2013



Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia.

Creative Commons licence

With the exception of the Coat of Arms, ATSB logo, and photos and graphics in which a third party holds copyright, this publication is licensed under a Creative Commons Attribution 3.0 Australia licence.

Creative Commons Attribution 3.0 Australia Licence is a standard form license agreement that allows you to copy, distribute, transmit and adapt this publication provided that you attribute the work.

The ATSB's preference is that you attribute this publication (and any material sourced from it) using the following wording: *Source:* Australian Transport Safety Bureau

Copyright in material obtained from other agencies, private individuals or organisations, belongs to those agencies, individuals or organisations. Where you want to use their material you will need to contact them directly.

Addendum

Page	Change	Date

Electrical system event involving a Cirrus SR22T, VH-LBQ

What happened

On 5 August 2013, at about 1240 Eastern Standard Time (EST),¹ a Cirrus SR22T aircraft, registered VH-LBQ, was being operated on a private flight from Archerfield to Kingaroy, Queensland, with the pilot and one passenger on board.

On approach to Kingaroy, at about 500 ft above ground level (AGL), the pilot extended the flaps and, shortly after, disconnected the autopilot (AP). Upon disconnecting the autopilot, the pilot reported that the aircraft pitched-up violently due to trim runaway. The AP pitch trim was trimming the aircraft for a nose-up position, even though the AP was

VH-LBQ



Source: Pilot

disconnected. This required the pilot to use a large amount of forward physical force to maintain stable flight. He attempted to resolve the problem several times by pressing and holding the autopilot disconnect switch (AP DISC) located on the control yoke, however, this had no effect. The pilot then conducted a go-around.

He then used the manual electric trim (MET) hat switch located on the control yoke, in an attempt to trim the aircraft nose-down. As the pilot was using the MET to trim the aircraft, which was going against the AP pitch trim runaway, the trim adjusted at a slow rate. The pilot was able to regain sufficient control of the aircraft and land safely at Kingaroy.

The pilot reported that, upon parking the aircraft and after releasing the MET, the pitch trim was at full nose-up deflection.

Flight systems

Automatic flight control system

The aircraft was equipped with an automatic flight control system (AFCS), which included a flight director function that provided pitch and roll commands when activated. The AFCS also included an AP function which controlled the aircraft pitch, roll and yaw attitudes following the commands received from the flight director when activated. The autopilot could be disconnected by pressing the AP DISC switch mounted on the control yoke. If the AP DISC switch was depressed, the AP and the MET would not operate until the AP DISC switch was released.

Electronic stability

The aircraft was also equipped with an electronic stability and protection (ESP) system, capable of providing automatic control inputs when the aircraft attitude exceeded predefined limits. The ESP system could be interrupted by pressing and holding the AP DISC switch.

Pitch trim control

The trim of the aircraft could only be manually controlled by the pilot using the hat switch mounted on the control yoke when the AP was disconnected.

¹ Eastern Standard Time (abbreviated EST) was Coordinated Universal Time (UTC) +10 hours.

Subsequent testing

As a result of the event, ground checks were carried out by a maintenance engineer who found no defects with the AP system and was unable to duplicate the event. Two successful test flights were also undertaken with no defects found with the AP system. The elevator trim was subsequently adjusted to correct an observed slight nose-up situation when the AP was disconnected.

On the basis of the evidence available to the ATSB, it was not possible to determine, with any certainty, the reason for the pitch-up event.

Electric trim/autopilot failure checklist

The pilot operating handbook for the aircraft stated, that in the event of an electric trim (MET) or AP failure, the pilot should maintain manual control of the aircraft, disengage the AP (if engaged) and, if the problem is not corrected, pull the circuit breakers for the pitch trim, roll trim and AP. If runaway trim occurred, de-energise the circuit by pulling the circuit (pitch trim, roll trim or AP) and land as soon as conditions permit.

Pilot comment

At the time, the pilot was unable to action the manufacturer's trim runaway abnormal checklist. The pilot believed that, if he had actioned the checklist, this would have made the situation more difficult. The circuit breakers were located on the left side of the centre console. The pilot elected not to pull the circuit breaker as he would have had to spend time searching for the correct circuit breaker, which would have been unsafe as the aircraft was close to the ground, close to the airport and he was still applying significant force against the trim runaway.

Safety action

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 action in response to this occurrence.

Aircraft operator

Red circuit breaker collars

VH-LBQ will be fitted with red circuit breaker collars around the relevant circuit breakers to make them easily identifiable.

Company procedure

The operator will now require all pilots operating the Cirrus SR22T aircraft to memorise the procedures for an electric trim or AP failure.

Safety message

The pilot's decision to go-around when the aircraft became difficult to handle is to be commended. The ATSB has investigated incidents and accidents which have resulted from pilots persisting with an unstable approach. This occurrence highlights the safety benefit to be gained from going around, which allowed the pilot time to troubleshoot and prepare for landing with the pitch trim difficulties. This decision helped ensure the aircraft landed safely.

General details

Occurrence details

Date and time:	5 August 2013 – 1240 EST		
Occurrence category:	Serious incident		
Primary occurrence type:	Electrical system event		
Location:	near Kingaroy aerodrome, Queensland		
	Latitude: 25° 34.85' S	Longitude: 151° 50.47' E	

Aircraft details

Manufacturer and model:	Cirrus Design Corporation SR22T		
Registration:	VH-LBQ		
Serial number:	0228		
Type of operation:	Private		
Persons on board:	Crew – 1	Passengers – 1	
Injuries:	Crew – Nil	Passengers – Nil	
Damage:	Nil		

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB 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.