

**AIRCRAFT ACCIDENT REPORT**  
**OCCURRENCE NUMBER 09/4139**  
**SCHEMPP-HIRTH GMBH VENTUS B/16.6**  
**ZK-GVP**  
**WIRE STRIKE AND SUBSEQUENT LOSS OF CONTROL**  
**NIKAU ROAD, BOMBAY HILLS, SOUTH AUCKLAND**  
**28 OCTOBER 2009**



## Foreword

As a signatory to the Convention on International Civil Aviation 1944 (“the Chicago Convention”) New Zealand has international obligations in respect of the investigation of accidents and incidents. Pursuant to Articles 26 and 37 of the Chicago Convention, the International Civil Aviation Organisation (“ICAO”) issued Annex 13 to the Convention setting out International Standards and Recommended Practices in respect of the investigation of aircraft accidents and incidents.

New Zealand’s international obligations are reflected in the Civil Aviation Act 1990 (“the Act”) and the Transport Accident Investigation Commission Act 1990 (“the TAIC Act”).

Section 72B(2)(d) and (e) of the Civil Aviation Act 1990 Act also provides:

### **72B Functions of Authority**

(2) The Authority has the following functions:

- (d) To investigate and review civil aviation accidents and incidents in its capacity as the responsible safety and security authority, subject to the limitations set out in section [14\(3\)](#) of the [Transport Accident Investigation Commission Act 1990](#):
- (e) To notify the Transport Accident Investigation Commission in accordance with section [27](#) of this Act of accidents and incidents notified to the Authority:

Following notification to the Transport Accident Investigation Commission (“the Commission”) of any accident or incident which is notified to the Authority, an investigation may be conducted by the Commission in accordance with the TAIC Act. CAA may also investigate subject to the requirements of the TAIC Act.

The purpose of an investigation by the Commission is to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future, rather than to ascribe blame to any person.

CAA however investigates aviation accidents and incidents for a range of purposes under the Act. Investigations are primarily conducted for the purpose of preventing future accidents by determining the contributing factors or causes and then implementing appropriate preventive measures - in other words to restore safety margins to provide an acceptable level of risk. The focus of CAA safety investigations is therefore to establish the causes of the accident on the balance of probability.

Accident investigations do not always identify one dominant or ‘proximate’ cause. Often, an aviation accident is the last event in a chain of several events or factors, each of which may contribute to a greater or lesser degree, to the final outcome.

CAA investigations may also inform other regulatory-safety decision making or enforcement action by the Director.

In the case of a fatal aviation accident, the final CAA investigation report will generally be highly relevant to an inquiry, and in some circumstances, an inquest, conducted by a Coroner.

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## **Glossary of abbreviations used in this report:**

amsl	above mean seal level
BFR	Biennial Flight Review
CAA	Civil Aviation Authority
GNZ	Gliding New Zealand
GPS	Global Positioning System
kVA	Kilovolt-amps
km	kilometres
MBZ	Mandatory Broadcast Zone
METAR	aviation routine weather report
nm	nautical miles
NZDT	New Zealand Daylight Time
UTC	Coordinated Universal Time
VHF	very high frequency
WGS 84	World Geodetic System 1984

## AIRCRAFT ACCIDENT REPORT

### OCCURRENCE No 09/4139

<b>Aircraft type, serial number and registration:</b>	Schempp-Hirth GmbH and Company KG Ventus B/16.6, 104, ZK-GVP
<b>Number and type of engines:</b>	Not applicable
<b>Year of manufacture:</b>	1982
<b>Date and time of accident:</b>	28 October 2009, 1559 hours <sup>1</sup>
<b>Location:</b>	Nikau Road, Bombay Hills, South Auckland Latitude <sup>2</sup> : S 37° 12.70' Longitude: E 175° 00.20'
<b>Type of flight:</b>	Private
<b>Persons on board:</b>	Crew: 1
<b>Injuries:</b>	Crew: 1 fatal
<b>Nature of damage:</b>	Substantial
<b>Pilot-in-command's licence:</b>	Gliding New Zealand QGP (Qualified Glider Pilot Certificate)
<b>Pilot-in-command's age:</b>	61 years
<b>Pilot-in-command's total flying experience:</b>	440 hours (approximately), 74 hours on type (approximately)
<b>Information sources:</b>	Civil Aviation Authority field investigation
<b>Investigator in Charge:</b>	Mr A M Moselen

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<sup>1</sup> All times in this report are NZDT (UTC + 13 hours unless otherwise stated)

<sup>2</sup> WGS 84 co-ordinates

## Synopsis

The Civil Aviation Authority (CAA) was notified of the accident at approximately 1630 hours on 28 October 2009. The Transport Accident Investigation Commission was in turn notified, but declined to investigate. A CAA field investigation was commenced the same day.

The pilot was on the return leg of a cross-country flight from Drury airstrip when an accompanying pilot in another glider observed that he had not arrived at the airstrip as expected. An aerial search was conducted of the area where the glider was last seen. The glider wreckage was found in a farm paddock. The pilot did not recover from the injuries he received in the accident, and died at the scene.

## 1. Factual information

### 1.1 History of the flight

- 1.1.1 On Wednesday 28 October 2009, two Drury Gliding Club pilots prepared their gliders, ZK-GVP and ZK-GPV, for a cross-country flight from Drury airstrip to Te Kauwhata and then return to Drury airstrip. At approximately 1420 hours, ZK-GPV was aero-towed and released overhead the airstrip. ZK-GVP was released in the same manner, nine minutes later.
- 1.1.2 Information obtained from the pilot operating ZK-GPV established that both gliders tracked south without any difficulties. To remain clear of the Mercer Mandatory Broadcast Zone (MBZ), both gliders proceeded on a track west of State Highway 1.
- 1.1.3 During the flight the pilots used thermals and 'cloud streets'<sup>3</sup> in order to sustain lift. Although the pilots often lost sight of each other, they remained in contact via VHF radio.
- 1.1.4 Data downloaded from both gliders' Volkslogger recorders established that they arrived overhead the general area of Te Kauwhata Township about the same time, having operated at heights ranging between 2400 and 3000 feet amsl. At this stage the pilot of ZK-GVP advised the other glider pilot by radio that he wished to return to Drury.
- 1.1.5 On the return leg both gliders generally followed State Highway 1, with ZK-GVP ahead and ZK-GPV positioned west, half a nautical mile behind. At 1549 hours, and some two and a half nautical miles west of Mercer Aerodrome and one nautical mile from Kelly Field Aerodrome, the pilot in ZK-GPV, at 2100 feet amsl, decided to change course to the west to find lift. The pilot of ZK-GVP, at 1300 feet amsl, continued directly towards Drury airstrip. This action surprised the pilot of ZK-GPV because he had expected to have been followed to the west in order to find lift.

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<sup>3</sup> Rows of cumulus clouds aligned parallel to the low level wind. They can provide glider pilots with lines of rising air, enabling them to fly for long distances.

- 1.1.6 During his search for lift, the pilot of ZK-GPV had observed his colleague circling low in the Bombay Hills. The pilot did not want to distract his colleague with radio communication at that stage but, on arriving back overhead the Drury airstrip and not seeing ZK-GVP, he attempted to make radio contact. Hearing no response the pilot returned to the Bombay Hills area to search for the glider.
- 1.1.7 A number of local residents had also witnessed the glider circling at low level in the Bombay Hills over the general area of Nikau Road. In particular, two high school students watched the glider head directly towards them as they walked east towards their home.
- 1.1.8 The students reported that the glider was on the northern side of Nikau Road when it appeared to head left towards a set of power lines before suddenly making a change of direction to the right. The glider struck the power lines, and was then seen to “twist” and drop to the ground.
- 1.1.9 The students and other witnesses went to the accident site and turned the glider over from an inverted position to find the pilot alive. However, the pilot did not recover from his injuries and died at the scene.
- 1.1.10 The last four minutes and forty-eight seconds of flight data for ZK-GVP is provided in Figure 1, page 14. It illustrates that once the pilot had entered the Nikau Road area he initiated a left turn then completed three right hand orbits before turning back to the left again. He then completed one left orbit prior to commencing another right hand orbit. The last recorded position depicts the glider on the northern side of Nikau Road. The projected final track of the glider is estimated to have extended from the last recorded position to the point of power line contact.
- 1.1.11 The accident occurred in daylight, at 1559 hours, in a farm paddock adjacent to Nikau Road, in the Bombay Hills, South Auckland, at an elevation of 738 feet. Grid reference NZ Topo50 BB32 778798, latitude S 37° 12.70', longitude E 175° 00.20'.

## 1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Other</i>
Fatal	1	0	0
Serious	0	0	0
Minor/None	0	0	

**Table 1: Injuries to persons**

## 1.3 Damage to aircraft

- 1.3.1 The glider was substantially damaged.

## **1.4 Other damage**

- 1.4.1 Two 22 kVA power lines and their support structure required repair, and there was minor damage to a farm fence.

## **1.5 Personnel information**

- 1.5.1 The pilot, aged 61 years, held a Gliding New Zealand Qualified Glider Pilot Certificate and a valid Gliding New Zealand Medical Declaration and Certificate.
- 1.5.2 The pilot had commenced glider flying in January 1972 and had accumulated approximately 70 hours by the end of that year. The pilot did no further flying until 1998. At the time of the accident he had flown approximately 437 hours in gliders, which included approximately 74 hours on type.
- 1.5.3 The pilot had conducted most of his flying in the Matamata district. He had then moved to Auckland and commenced flying from Drury airstrip during 2007.
- 1.5.4 On the day of the accident the pilot was described by the other pilot as appearing relaxed and in good spirits.

## **1.6 Aircraft information**

- 1.6.1 The glider, a Schempp-Hirth GmbH and Company KG Ventus B/16.6, serial number 104, was manufactured in Germany and registered in New Zealand as ZK-GVP during 1982.
- 1.6.2 The aircraft is a single-seat mid-wing all composite glider, equipped with a single retractable landing gear wheel. It utilises conventional flight controls with a wing trailing edge combination of flaps and dive brakes. There is provision for water ballast to be carried in the wings; however, none was required or uplifted for use on the day of the accident flight.
- 1.6.3 The glider was maintained in accordance with relevant Civil Aviation and Gliding New Zealand requirements. It had a non-terminating Airworthiness Certificate in the Standard Category.
- 1.6.4 The last recorded maintenance was a compass swing carried out during November 2008. The last Annual Review of Airworthiness was performed during August 2009. The inspection found no defects.
- 1.6.5 It was calculated that the weight and balance of the glider were within specified limits.

## **1.7 Meteorological information**

- 1.7.1 A south-west airstream was affecting the area at the time of the accident. The forecast was for cloudy conditions and south-westerly winds of 15 knots gusting to 25 knots. The actual weather reported at Auckland Aerodrome one hour either side of the accident was scattered clouds, visibility greater than 10 km, and a south-westerly wind of 16 knots.
- 1.7.2 The wind direction was likely to have created mechanical turbulence and possible downdrafts at lower levels from trees located upwind of the accident site.



## **1.8 Aids to navigation**

1.8.1 Not applicable.

## **1.9 Communications**

1.9.1 Other than the VHF communications between the pilots, no other communications were heard from the glider.

## **1.10 Aerodrome information**

1.10.1 Not applicable.

## **1.11 Flight recorders**

1.11.1 The glider was equipped with a data recording device (Volkslogger) incorporating a GPS unit. The data was downloaded and provided a history of the glider's geographical position, track, height, and ground speed.

## **1.12 Wreckage and impact information**

1.12.1 The accident site was in a farm paddock adjacent to Nikau Road. It was apparent from the debris trail and damage witness marks that the glider had struck two of three 22 kVA power lines and their supporting power utility pole with the outboard section of the left wing.

1.12.2 The collision caused the left outboard section of wing and aileron to completely detach. With some of its forward energy dissipated, the glider had then descended left wing down and struck terrain. At that stage, the glider was in a slightly nose low attitude at a bank angle of approximately 110 degrees.

1.12.3 Impact forces caused bending failure of the glider's left wing spar at the wing root. The glider then cart-wheeled forward over a fence and struck the ground again, sustaining substantial damage to the left hand side of the nose section. The glider finally came to rest in an inverted position.

1.12.4 All components of the glider were accounted for at the accident site. The tail section had almost completely detached. Crush damage and burn marks were evident on the left wing tip, consistent with initial impact to the upper power line and also with the power utility pole's cross arm.

1.12.5 Contact with one of the lower power lines was indicated by a seven centimetre diameter burn mark inboard on the lower surface of the left wing. There was evidence of a wire scuff mark and a soot trail aligned with the chord<sup>4</sup> of the wing.

1.12.6 Although the left aileron, tail section, and left wing were destroyed in the impact sequence, flight control integrity was established. There was considerable disruption to the left wing combination flap and spoiler actuating mechanisms. However, witness marks on the left fuselage in the wing root area indicated that

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<sup>4</sup> The chord of an aircraft wing, is the distance from the front or "leading" edge of a wing to the rear or "trailing" edge.

the flap and spoiler systems were fully retracted prior to the left wing striking the ground.

- 1.12.7 The retractable main landing gear was found partially extended and the landing gear control lever was in between the retracted and extended position.

The student witnesses recalled that before they rolled the glider over, the wheel was not extended. They also related that they did not notice the glider flying with the main wheel extended.

- 1.12.8 It was noted during the wreckage examination that the glider was equipped with an oxygen system but the oxygen bottle had been removed. The associated tubing and couplings had not been secured adequately, nor were they blanked off. There was no record of the oxygen cylinder removal in the Aircraft Maintenance Logbook.

### **1.13 Medical and pathological information**

- 1.13.1 Post-mortem examination determined that the cause of death was from internal injuries.
- 1.13.2 The post mortem also indicated the pilot had coronary heart disease (unsuspected).
- 1.13.2 Toxicological tests for the pilot disclosed no evidence of alcohol, medicinal, or recreational drugs.

### **1.14 Fire**

- 1.14.1 Fire did not occur.

### **1.15 Survival aspects**

- 1.15.1 Although the pilot was restrained by a combined lap and shoulder harness, the impact forces were not survivable.

### **1.16 Tests and research**

- 1.16.1 Nil.

### **1.17 Organisational and management information**

- 1.17.1 Not applicable.

### **1.18 Additional information**

- 1.18.1 Upon first arriving in the Nikau Road area, the glider was only approximately 200 feet above the surrounding terrain. The glider's forward progress would have been restricted by the ridge lying ahead and east of the desired track. Further constraints to the way ahead were two sets of power transmission lines and towers (larger than the power lines that were struck by the glider).
- 1.18.2 Adjacent to the intersection of Nikau Road and Razorback Road is an agricultural airstrip that was directly ahead of the pilot as he flew towards Drury. The orientation and size of the paddock provided an ideal up-slope out-landing

opportunity, albeit with a quartering tailwind. The pilot flew overhead the airstrip as he carried out a series of orbits in the area.

- 1.18.3 Adjacent to the accident site was a farm paddock aligned east-west. The sloping paddock was short in length and contained live stock. All likely approach directions to the paddock are impeded by surrounding undulating terrain, trees, and power lines. The power lines had only been recently installed at Nikau Road.
- 1.18.4 The pilot's wife recalled that the pilot preferred "to get home", but had an arrangement for retrieval of the glider in the event of an out-landing. A set of car keys and a cell phone were located amongst the pilot's personal belongings in the glider. Records provided to the safety investigation indicated no calls were made to or from the cell phone number during the flight.
- 1.18.5 Assistance in analysis of the Volkslogger flight data using 'See You' software was provided to the investigation by Gliding New Zealand (GNZ). When overlaid on Google Earth, GNZ made the observation that there did not appear to be a good soarable ridge in the accident site area. In addition, the pilot had no turning points or any out-landing sites stored in his Volkslogger GPS unit.

## **1.19 Useful or effective investigation techniques**

- 1.19.1 Nil.

## **2. Analysis**

- 2.1 Evidence gathered by the safety investigation would indicate the accident occurred as a result of the aircraft being unable to be recovered after striking power lines. Given the circumstances leading up to the impact with power lines, it is unlikely that the unsuspected heart disease discovered by autopsy had any influence in the development of the accident.
- 2.2 The more likely explanation for the accident rests with the pilot not being able to avoid the wires during a series of orbits. Furthermore, the orbits were probably initiated in an effort to gain sufficient height to clear the Bombay Hills in order to reach Drury airstrip.
- 2.3 With no turning points or out-landing sites stored in the GPS unit of the Volkslogger, GNZ made the observation from their analysis of ZK-GVP's flight data trace that by ignoring Kelly Aerodrome, Mercy Aerodrome, and any number of suitable farm paddocks, the pilot appeared to have had no immediate alternative plan for an out-landing and was probably influenced by plan continuation bias<sup>5</sup>.
- 2.4 The wife of the pilot mentioned that he had an arrangement to be picked up in the event of an out-landing. The bias may also explain why the pilot discarded this option in favour of trying to reach Drury airstrip and also why he did not follow his colleague to the west to find lift.

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<sup>5</sup> A deeply rooted tendency of individuals to continue their original plan even when changing circumstances require a new plan.

- 2.5 When the pilot reached the Nikau Road area he was at a low altitude and had insufficient height to safely clear the ridge line ahead. In addition, he was blocked from circling over the ridge line by an array of power transmission lines and towers. This provided the pilot with fewer manoeuvring options, increased risk, and possibly a marked increase in the levels of personal stress to the extent he may not have noticed the agricultural airstrip.
- 2.6 The pilots decision to remain in the area and circle was described by GNZ as scratching<sup>6</sup> and not looking to land.
- 2.7 The likelihood of mechanical turbulence and downdrafts in the area was not ruled out and may have had an influence during the last orbit to the extent that the glider's path became obstructed by the Nikau Road 22 kVA power lines.
- 2.8 As a consequence, the outcome highlights the importance of pre-flight planning, including the acknowledgement of pre-determined contingencies by the pilot in command. With respect to gliding, foreknowledge of good out-landing sites and a willingness to use them in a timely manner would greatly assist in mitigating this type of accident.

### **3. Conclusions**

- 3.1 The pilot was type rated and appropriately qualified for the flight.
- 3.2 The glider had a valid Airworthiness Certificate and had been professionally maintained. However the removal of the on-board oxygen system was undocumented in the Aircraft Maintenance Logbook, but is not considered to have contributed to this accident.
- 3.3 During the cross country flight, the pilot had adequate opportunities to conduct an out-landing but chose to continue towards rising terrain.
- 3.4 By choosing not to out-land earlier, the pilot ended up flying at low level to an area that provided him with few options for making a safe out-landing.
- 3.5 During a series of low level orbits, the glider struck power lines and as a result, received substantial wing damage which made the glider uncontrollable.
- 3.6 The damage was such that the situation was irrecoverable.
- 3.7 The force of the gliders impact with the terrain, and the injuries sustained by the pilot were not survivable.

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<sup>6</sup> A colloquial term used in gliding for remaining aloft in weak lift

## 4. Safety actions

- 4.1 On 10 February 2010, in response to this accident and a spate of occurrences involving gliders, the CAA conducted a meeting with the executive of Gliding New Zealand. It was agreed that CAA and Gliding New Zealand would combine their efforts to increase safety awareness amongst those actively involved in gliding activities. The CAA would also maintain the partnership with Gliding New Zealand by actively involving the organisation's key safety personal in any serious accident or incident involving glider operations.
- 4.2 The CAA published an article in *Vector*<sup>7</sup> March/April 2010 titled *–Be Prepared for an out landing.*
- 4.3 Gliding New Zealand has published three articles in its June 2010 publication, *Soaring*. They are:
- Gliding –Threat and Error Management – *Or how to reduce mistakes and fly safely.* The article is the first in a three part series.
  - Paddock Landing Decisions – authored by the Northern Regional Operations Officer.
  - Safety Recommendations – *A question of safety* – authored by the National Operations Officer.

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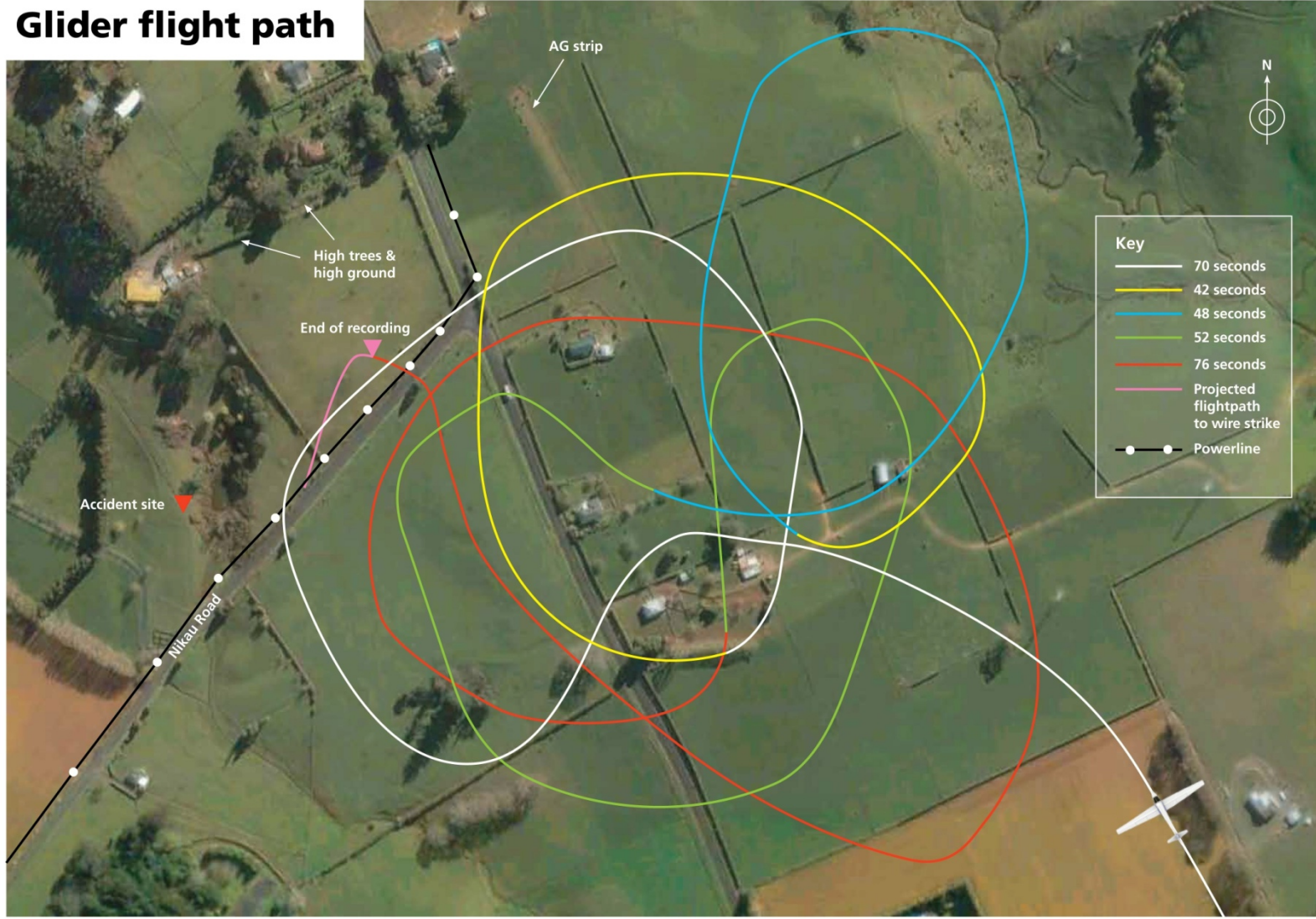
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<sup>7</sup> *Vector* is a safety magazine published by the Civil Aviation Authority of New Zealand and distributed free to all certificate holders and licensed personal.

# Glider flight path



**Figure 1**  
**Last four minutes and forty eight seconds of ZK-GVP flight path data.**