

POINTING TO SAFER AVIATION

# vector

July / August 2010



## ELT Airworthiness Directive

It's Not a Tractor

In the Drink

Too Close for Comfort?



## Artex AD

An Airworthiness Directive has been issued on Artex ELTs after a large number of G-switch failures. Your aircraft could be affected.



## Too Close for Comfort?

During simulated forced landing practice, you must not fly too close to any structures and people. Imagine a cylinder protecting the airspace around every dwelling.



## It's Not a Tractor

Bounce a tractor into a ditch or clip it on the side of the shed and it will probably be okay. Do that to your aircraft, and it could be a total loss. It's all about design strength. Cars and tractors have wide strength margins, while aircraft do not.



## In the Drink

A ditching is a water landing made under control, rather than a crash into water. A new Advisory Circular gives guidance on this topic.

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## Artex AD

There are over 1300 Artex Emergency Locator Transmitters (ELTs) fitted to aircraft in New Zealand – a fault with these ELTs may affect your aircraft.

If your aircraft is fitted with an Artex ELT, you need to take the action outlined in a new Airworthiness Directive (AD) now to ensure you can be found in an emergency.

The G-switch in your ELT is what activates your beacon in an accident. Due to a large number of G-switch failures, the CAA has issued AD DCA/RAD/54, reducing the test interval for the G-switch from two years to six months.

The CAA is working with the United States Federal Aviation Administration and the US manufacturer to understand the reason for the failures. The G-switch is a metal ball within a plastic tube. Under sudden deceleration, the ball travels along the tube against the spring and activates the switch. Under normal conditions, the ball remains in one place, but aircraft vibration may be wearing a groove in the plastic housing – preventing the ball from moving freely when decelerated.

The manual switch on your ELT is not affected by this fault. It is always best to turn the ELT on yourself, as soon as an emergency situation develops, rather than waiting for the bang to do it for you. You can always call to say you are ok if it turns out you don't need assistance.

To find out if your ELT is affected, go to the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), "Airworthiness Directives". For more information about this AD contact Airworthiness Engineer Ron Doggett, email: [ron.doggett@caa.govt.nz](mailto:ron.doggett@caa.govt.nz).

Photos: Sandra Crosbie

## Few Faults Reported

The fault with Artex ELT G-switches came to the CAA's attention via a small, slow-growing pile of defect reports, anecdotal comments from the aviation industry and an internal safety study on a related matter. If every failure had been correctly reported, the fault would have been very obvious much sooner.

In the two years to April 2010, the CAA received 26 Artex ELT G-switch defect reports, filed via occurrence reporting form CA005, but it was later discovered that more than 70 faults had been identified by aircraft operators.

Aircraft operators (owners) had sent the faulty ELTs for repair, but had not notified the CAA. As a result, the emerging pattern of faults was masked from the CAA.

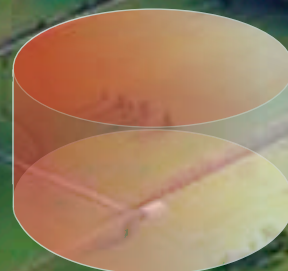
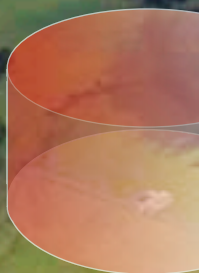
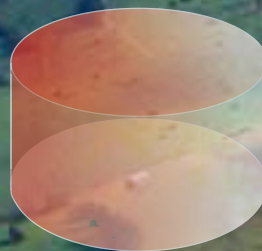
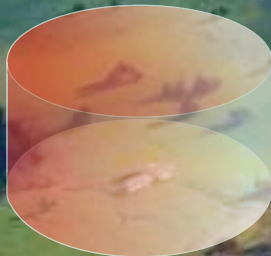
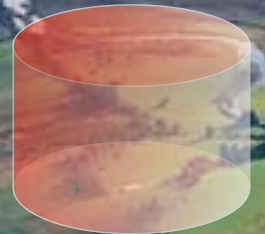
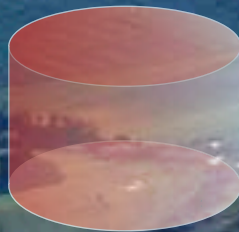
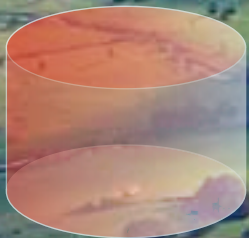
Aircraft operators (owners) are responsible for reporting defects to the CAA. This is not the responsibility of maintenance organisations. In particular, a fault to any emergency system or equipment must automatically be reported.

It is fortunate that the CAA was able to piece together the problem, and publish an Airworthiness Directive requiring that every Artex ELT G-switch be tested before there was an aircraft accident in which the ELT did not operate.

Occurrence reporting requirements are detailed in Advisory Circular 12-1 *Mandatory Occurrence Notification and Information*, available on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), under "Advisory Circulars". ■

# Too Close for Comfort?

Imagine a cylinder with a 150 m (492 feet) radius that's 500 feet high. Now, imagine picking it up and dropping it over the top of every house in a typical semi-rural scene. Is the area still a good place for your simulated forced landing practice?



Urban sprawl and the increasing popularity of lifestyle blocks is reducing the space available for training organisations and students to carry out simulated forced landing practice. In some areas, the issue is reaching fever-pitch, with residents complaining about aircraft noise and disruption to livestock, while students struggle to meet their training requirements. Residents also express concern for their safety, and for that of the pilots flying low level near terrain and buildings.

Much land use is in a constant state of development. Just because your training

organisation has been using a particular paddock for years, does not mean it can necessarily continue to do so.

Under rule 91.311 (a) *Minimum heights for VFR flights*, you must not fly VFR less than 500 feet above any structures and persons. You must also maintain a horizontal radius distance of 150 metres. It may help to imagine this as a virtual cylinder or no-fly zone around each structure and person. Applying this method may preclude areas that have been available for simulated forced landing practice in the past.

Rolling hilly areas can present another challenge. If a dwelling is elevated on a hill, you must be no lower than 500 feet above that structure, not just the surrounding flatter land.

Pilots failing to adhere to this rule requirement risk infringement notices or prosecution for breaching the minimum height rule, or for negligent, careless or dangerous flying.

Rule 91.311 (a) *Minimum heights for VFR flights* is available on the CAA web site [www.caa.govt.nz](http://www.caa.govt.nz), under "Rules". ■

*Rolling hilly areas can present another challenge. If a dwelling is elevated on a hill, you must be no lower than 500 feet above that structure, not just the surrounding flatter land.*



# A Matter of Record

About 500 feet after takeoff the pilot of a Trislander with 10 passengers on board heard a “pattering” sound. Seconds later the right-hand propeller assembly detached from the crankshaft flange and sliced into the side of the aircraft.


The right-hand engine crankshaft had been in service 392.4 hours longer than engineers realised, and was well overdue for overhaul.

The Britten Norman Trislander landed safely after the accident in July 2009, with minor injuries to three of the 10 passengers. The Transport Accident Investigation Commission (TAIC) investigation found that the right-hand engine had been imported from Indonesia with records that understated its time in service. In all, the part was found to have been in service 392.4 hours longer than the records stated, which meant it was 230.2 hours overdue for overhaul.

The error was uncovered only because the engine had been fitted to an airframe in Bali that was later retired. After the engine was imported to New Zealand, the aircraft operator also imported the retired airframe to use for spare parts.

After the accident, engineers cross-checked the records of this airframe with those of the engine and detected the anomaly in recorded time in service.

Had the company known the real operating hours, the engine would have been overhauled well before the crankshaft failure, and this accident would not have occurred.



Broken crankshaft flange that was attached to the right engine propeller hub.

Photo: New Zealand Defence Technology Agency

Photo: TAIC



Assessing the legitimacy of an internationally sourced aircraft part is both a systematic and a subtle skill. Advisory Circular 00-1 *Acceptability of Parts* provides guidance for ensuring the traceability, type conformity and quality of parts. It explains the documentation that should accompany parts, such as the nomenclature, part number, eligibility for use, quantity, serial or batch number, and status, including fatigue, cycle, shelf or overhaul life. The documentation should also clarify any limits to the use of the part and any associated Airworthiness Directives or Service Bulletins.

AC00-1 also advises how to screen a potential supplier, such as checking their authorisation to supply, considering whether the price is similar to that quoted by other suppliers, and whether the promised delivery date is markedly faster. Purchasers should also ensure the accompanying drawings, specifications and overhaul manuals are provided, and

*Had the company known the real operating hours, the engine would have been overhauled well before the crankshaft failure, and this accident would not have occurred.*

that packaging appears to reflect the purported source of the part. Suspect any supplier that suggests an unlimited supply of parts is available. The part itself should also be visually inspected for serial numbers in abnormal positions, flecks of both new and old paint and other abnormalities to the surface finish.

The AC also discusses surplus parts and ex-military parts, and provides advice for both operators and installers.

View Advisory Circular AC00-1 *Acceptability of Parts* on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz). Advisory Circulars are under Quick Links on the home page.

The Transport Accident Investigation Commission's full report on the accident (09-004) can be found on its web site, [www.taic.org.nz](http://www.taic.org.nz) ■



Photo: TAIC

# Putting Our Socks Up

They had amassed about 30,000 agricultural flight hours between them, equating to about 360,000 sorties.

**E**arlier this year, two experienced agricultural pilots were involved in similar accidents – within days of each other. One suffered serious injuries, the other moderate injuries. Both aircraft were destroyed.

In both cases, the aircraft were overloaded for the ambient conditions, both had been using airstrips that were considered marginal for agricultural aircraft operations, both accidents occurred on the first flight of the day from those strips, and both aircraft hit terrain in the takeoff flight paths.

Neither pilot used a windsock.

In 2008 a 13,000-hour agricultural pilot walked away from the wreckage after

CAA Safety Investigator Mark Houston has 12,000 agricultural flight hours, and earlier this year produced a study of recent agricultural accidents, hoping to identify common trends.

“No one factor can be singled out as the cause of these accidents, but we do know that the pilots involved tend to be very experienced, the accidents tend to happen on takeoff, there’s a reluctance to use safety helmets, and there’s poor use of wind-socks to determine how the aircraft is going to perform.

“We can’t make pilots any younger, but we can encourage them to wear safety helmets, and to use portable windsocks on farm strips,” Mark says.

windsock would have alerted the pilots that they were operating closer to the edge of the performance envelope than they thought.

“To me, not getting the loader driver to bung your portable windsock in the right place on your remote strip is like driving off in a car without your seat-belt on.”

Bob Monds has more than 23,000 agricultural hours and runs Rural Air Services at Feilding.

“Windsocks are an essential safety factor in my operation. Most accidents happen around the strip, and that’s where you want to know what the wind is,” Bob says.

the aircraft refused to climb in a tail wind. No windsock was in use. In 2008 a 12,000 hour pilot was killed after experiencing sink after takeoff, striking a fence and losing control of the aircraft. A windsock was in use, but was in the wrong location. This year a 22,000-hour pilot suffered moderate injuries after the aircraft failed to climb after takeoff in tail-wind and up-slope conditions. No windsock was in use. Also this year, a 7000-hour pilot suffered serious injuries after the aircraft failed to climb in warm, gusty conditions. A windsock was available, but is thought not to have been used.

There have been more. In the past two and a half years, accidents such as these have cost the agricultural aircraft industry more than \$5 million in capital – to say nothing of the human loss.

“Windsocks will give you more than wind direction and speed at takeoff. Combined with your local knowledge, they can be a potent indicator of what effect terrain is having at a strip, when conditions are changing or when a local phenomenon, such as a sea breeze has kicked in.

“With a lot of agricultural experience, you get a feel for the wind, and you use other indicators to assess its strength and direction, such as tree branches bending, ripples on water, spray and smoke drift, but these are just adjuncts to a windsock, which everyone else in aviation relies on wherever possible,” Mark says.

“We’re not saying that these accidents wouldn’t have happened if a windsock had been in use, but in all cases a correctly positioned and observed

“You can feel when the wind’s getting up in the aircraft, but the windsock will tell you the strength and direction at a glance. And it’s white or bright orange, so it sticks out, while trees tend to blend into the background.

“It only takes a minute to put it up.”

## Learn more

Read a fuller discussion of this agricultural aviation safety concern on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), under “General Aviation”.

A recommendation to use windsocks will be included in an Advisory Circular to Part 137, which is currently being developed. Once completed, this draft AC will be posted to the CAA web site for comment. ■





*We can't make pilots any younger, but we can encourage them to wear safety helmets, and to use portable windsocks on farm strips.*

### **Windsock tips**

- » Pilots should direct the position of the windsock to get a clear indication of the wind speed and direction. This is especially important when another crew member, such as a loader driver is putting up the windsock.
- » Position the windsock to indicate the ambient wind speed and direction, but consider any potential changes that could affect aircraft performance.
- » Ensure the windsock is visible to the pilot from within the aircraft when in the loading area if possible and particularly during the takeoff run.
- » Choose a windsock of a suitable size and material, with good elevation.
- » Get to know how your windsock appears at various wind strengths and have some trial runs at local strips.



Bob Monds,  
Rural Air Services,  
Feilding

# You're It

When you're training to fly, someone else maintains the aircraft. When you hire an aircraft, the flying school or aero club arranges the aircraft's maintenance. When you buy an aircraft, you become its 'operator', and the responsibility for maintenance is suddenly yours.

That's quite a tall order for a pilot who's not also a maintenance engineer – a whole new language, new piles of paper work, and a great deal of responsibility.

New operators may proceed undaunted, feeling certain that if work needs to be done, their maintenance organisation, or the CAA will contact them. In fact, it is the responsibility of the aircraft operator to ensure the aircraft is maintained in an airworthy condition. You may have an engineering company that plans much of this work for you, and does contact you when something needs to be done. If so, you are fortunate, but you are still not absolved of the responsibility for ensuring the maintenance is carried out at the appropriate time.

As an operator, the ideal position to be in is to have access to both the aircraft's

routine maintenance requirements, and the unexpected requirements that may emanate from the CAA, the aircraft's manufacturer, or other sources over the life of the aircraft. Armed with this knowledge, you can forward plan your aircraft's maintenance and develop good two-way communication with your maintainer.

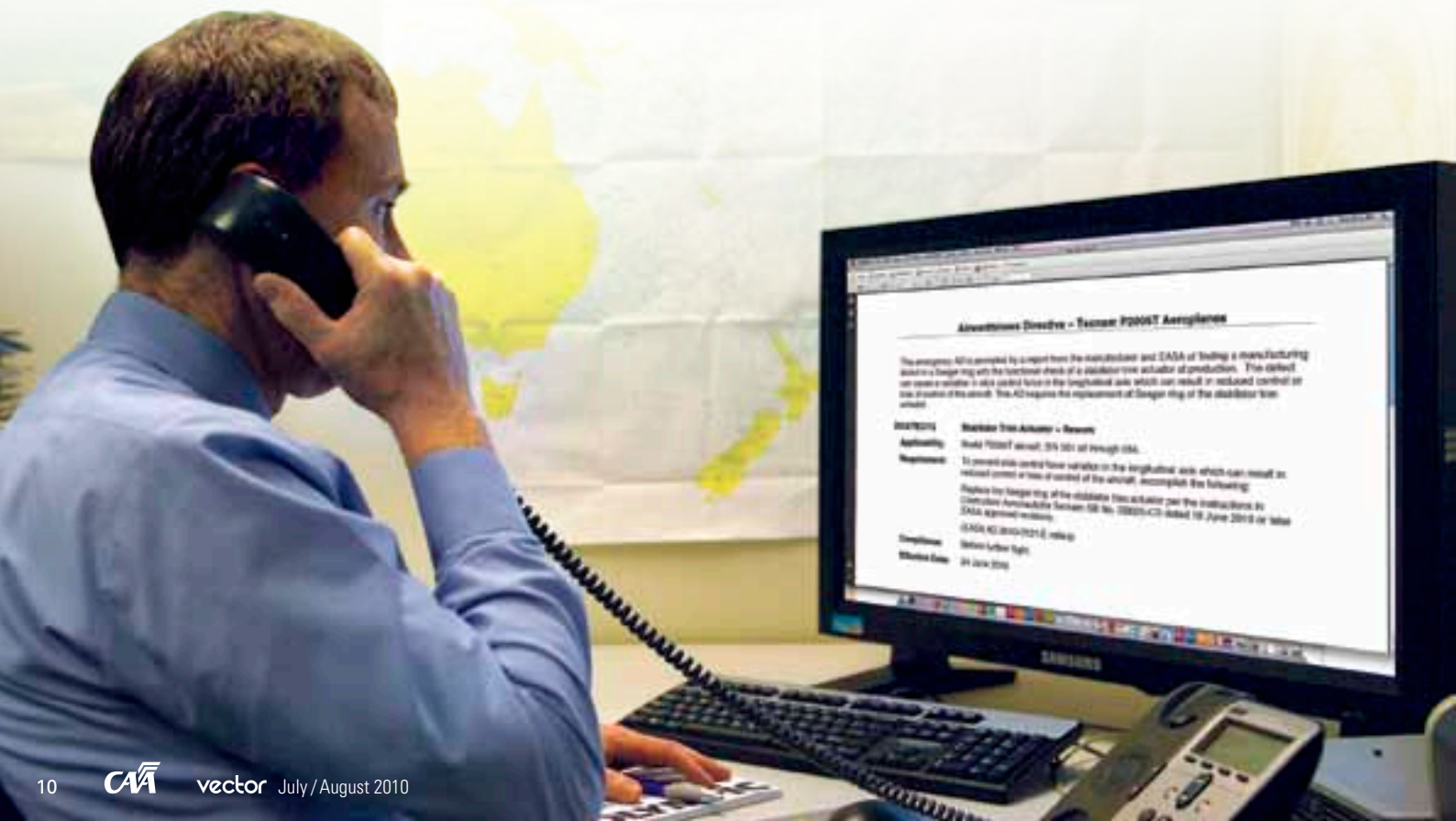
## Type Matters

Before you buy, consider the maintenance implications of the type you choose. Will the maintenance provider have all the current maintenance manuals, service information, special tooling and parts support for your aircraft?

These manuals are now often called Instructions of Continued Airworthiness. They are made up of sections that list the regular periodic inspections required

for each of your aircraft's components, plus additional sections that can include Manufacturer's Special Instructions, Component Overhaul/Replacement Time Limits, or even Vendor Established Replacement Time Limits.

These limits could relate to trim actuator overhauls, engine controls, airframe and engine hoses, oil coolers, seat belts, electric fuel pumps etc. The requirements vary considerably between manufacturers, so it is important that you have a good idea of what these additional inspection/replacement items are likely to cost. One useful way to know what's looming is to develop a simple spreadsheet together with your maintenance provider – you are assured of the right parts being available at the right time, and your maintenance provider is not forced to constantly be the bearer of unexpected, costly news.



Some aircraft manufacturers offer more maintenance support than others. Some have free online continuing airworthiness information, while others provide this only via costly subscription services. Your maintenance provider may be somewhat reluctant to take on a very costly subscription service for an aircraft that is a one-off, especially if it is expected to fly few hours.

Some manufacturers offer user groups to which you can subscribe and receive access to additional operational and service information – consider for example, [www.cessna.org](http://www.cessna.org), and, [www.piperowner.org](http://www.piperowner.org).

Before choosing an ex-Military type aircraft, research what level of support is available. There are some web-based user groups that share information to assist with your operational and maintenance requirements. For example, if you have chosen the Yakovlev Yak 52, consider [www.russianaeros.com](http://www.russianaeros.com), [www.yakuk.com](http://www.yakuk.com), and the United Kingdom's Civil Aviation Authority web site page, [www.caa.co.uk/CAP661](http://www.caa.co.uk/CAP661), which lists UK Mandatory Permit Directives.

## Review of Airworthiness

Formerly known as the Annual Review of Airworthiness (ARA), a Review of Airworthiness must be completed every 365 days for most GA Aircraft. Special Category aircraft are the exception, and now have a 730-day period. A Review of Airworthiness can be carried out only by a Licensed Aircraft Maintenance Engineer who holds an Inspection Authorisation (IA). During the Review of Airworthiness, the IA holder checks that all the inspections listed in Civil Aviation rule 43.153 *Review requirements* have been done. This includes checking that currently, and back through the last 365 days:

- » the aircraft conforms to the Type Certificate Data sheet;
- » has all the required instruments and equipment, and that all modifications and repairs have been correctly recorded, with the applicable technical data listed;
- » that all due maintenance on the aircraft maintenance programme has been correctly recorded and certified;
- » that the maintenance programme is the correct one for your aircraft;

- » that all the relevant ADs have been assessed, embodied as required, and properly recorded;
- » that every defect has been properly recorded and rectified, and the aircraft released to service;
- » that instruments and equipment that are permitted to be inoperative are properly placarded and recorded;
- » that the aircraft weight and balance is properly controlled and documented;
- » that the aircraft Flight Manual and its supplements are current;
- » and that all the overhaul and finite lives are recorded, and are within the manufacturer's or CAA acceptable limitations.

The last check is a general condition inspection of the aircraft, but remember, a Review of Airworthiness does not constitute a pre-buy inspection.

## Airworthiness Directives

Airworthiness Directives (ADs) are mandatory airworthiness requirements that are issued by the CAA. They specify modifications, inspections, conditions or

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limitations to be applied to an aircraft or part to correct an unsafe condition.

The CAA monitors ADs issued by the Airworthiness Authority in the country of origin of all aircraft types flown in New Zealand. For example, if the Federal Aviation Authority of the United States issues an AD for an aircraft, engine, propeller, or component, for an aircraft of American origin, it will be examined by the CAA's Aircraft Certification Unit, and it is very likely that a CAA AD will be issued.

An AD may also be issued as a result of a safety concern with an aircraft type or component that has been discovered in New Zealand. This CAA AD may then be applied in other countries.

ADs are issued for the most urgent problems that present significant risk to safety. All ADs are available free on the CAA web site. You can subscribe to be notified by email when Airworthiness Directives are published.

## Service Information

As well as Airworthiness Authorities, aircraft manufacturers also continually publish service information about their aircraft and its components. Operators should ensure they have access to this information. Although more significant faults are likely to evoke ADs, the AD process is detailed and can be time-consuming. It is very possible that any free replacement deal offered by a manufacturer could be expired before an AD is even released. As an actively involved operator, staying ahead of the game can save you money.

Service information is variously called Service Bulletins, Service Letters, Alert Bulletins, Service Notices, Service Instructions, and Information Bulletins. Manufacturers generally list this information on their web sites under a heading such as Product Support.

## Continuing Airworthiness Notices

Airworthiness Authorities, including the CAA, occasionally wish to announce maintenance information about aircraft types that does not warrant an AD, but that is still useful to operators.

The CAA publishes this information as Continuing Airworthiness Notices (CANs) on the web site's AD page. The FAA publishes Aviation Maintenance Alerts. These can be found at, [www.faa.gov](http://www.faa.gov), under "Aircraft – Aircraft Safety – Aircraft Safety Alerts".

Aviation Maintenance Alerts provide the aviation community with an economical way of exchanging service experiences and assist the FAA in improving aeronautical product durability, reliability and safety.

The FAA also issue Special Airworthiness Information Bulletins or SAIBs.

These are tools that alert, educate, and make recommendations to the aviation community. SAIBs contain non-regulatory information and guidance that does not meet the criteria for an Airworthiness Directive. View them at [www.faa.gov](http://www.faa.gov), under "Aircraft – Aircraft Safety – Aircraft Safety Alerts".

Australia's Civil Aviation Safety Authority (CASA) publishes Airworthiness Bulletins or AWBs. These provide information for maintenance personnel and operators and Airworthiness Advisory Circulars (AACs) containing additional advisory information. View them on the CASA web site, [www.casa.gov.au](http://www.casa.gov.au), under "Airworthiness – Continuing Airworthiness – Airworthiness Bulletins". The CAA web site also has links to advisory airworthiness material on certain overseas web sites.

Recreational owners realise their love of flying comes at a cost. Being as prepared as possible for the real operating cost of owning an aircraft will help reduce any unexpected charges, and belonging to an ownership group will generally help too.

For more help, contact the CAA, email [info@caa.govt.nz](mailto:info@caa.govt.nz) ■

## Inspection Authorisation Initial Course

Expressions of interest are called for a Part 66 Inspection Authorisation Initial Course. An IA Certificate is an additional qualification, over and above holding a Part 66 AME Licence, to perform and certify Reviews of Airworthiness and conformity of Major Modifications and Repairs. A Renewal Course is currently planned to be run in March 2011.

Contact Examiner AME Mark Price, email: [mark.price@caa.govt.nz](mailto:mark.price@caa.govt.nz)



# RNAV

## Missed Approaches

In uncontrolled airspace, or in controlled airspace with no radar coverage, missed approach procedures using traditional navigation aids all follow the same recipe. They take you back to the overhead, or to an arc, from which you can commence a second approach.

The same cannot be said for all RNAV missed approach procedures. Some take you back to the Intermediate Fix (IF) or Initial Approach Fix (IAF), while others require you to figure out for yourself how to get there. A missed approach is an extremely busy time. If you haven't already

thought about how you will get back for a second approach, this will load you up even more.

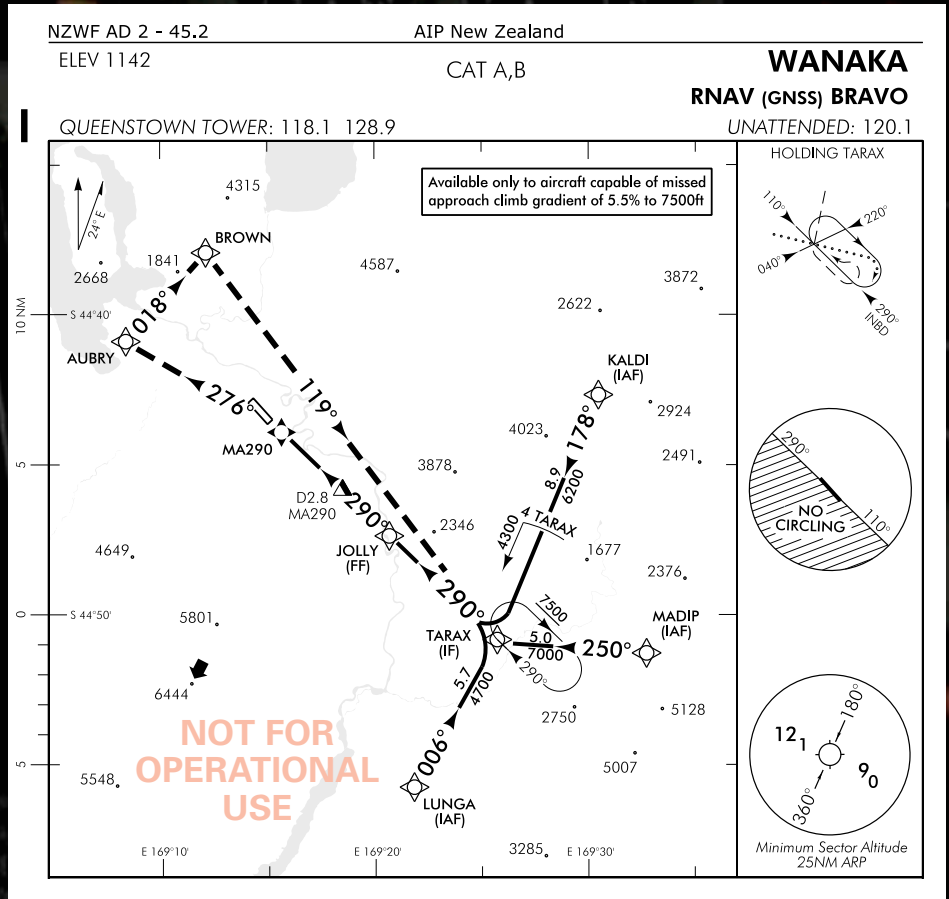
There are four different types of RNAV missed approach. The first two types do take you back to the IF or IAF so that you can start another approach, but they do this in different ways.

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## RNAV Missed Approach 1

This is the easiest type to fly. When you get to the missed approach point, additional waypoints along the missed approach are already loaded into the GPS (as part of the approach procedure). Automatic waypoint sequencing stops at the missed approach point, but all you need to do is continue in LEG mode, and manually sequence the first waypoint on the missed approach by using the DIRECT TO function. An example of this is the Wanaka RNAV (GNSS) BRAVO. This missed approach takes you via waypoints AUBRY and BROWN, back to the IF (TARAX), putting you where you need to be to commence a second approach. Alternatively, many missed approaches of this type may require you to track DIRECT TO the IF or IAF without going via other waypoints.

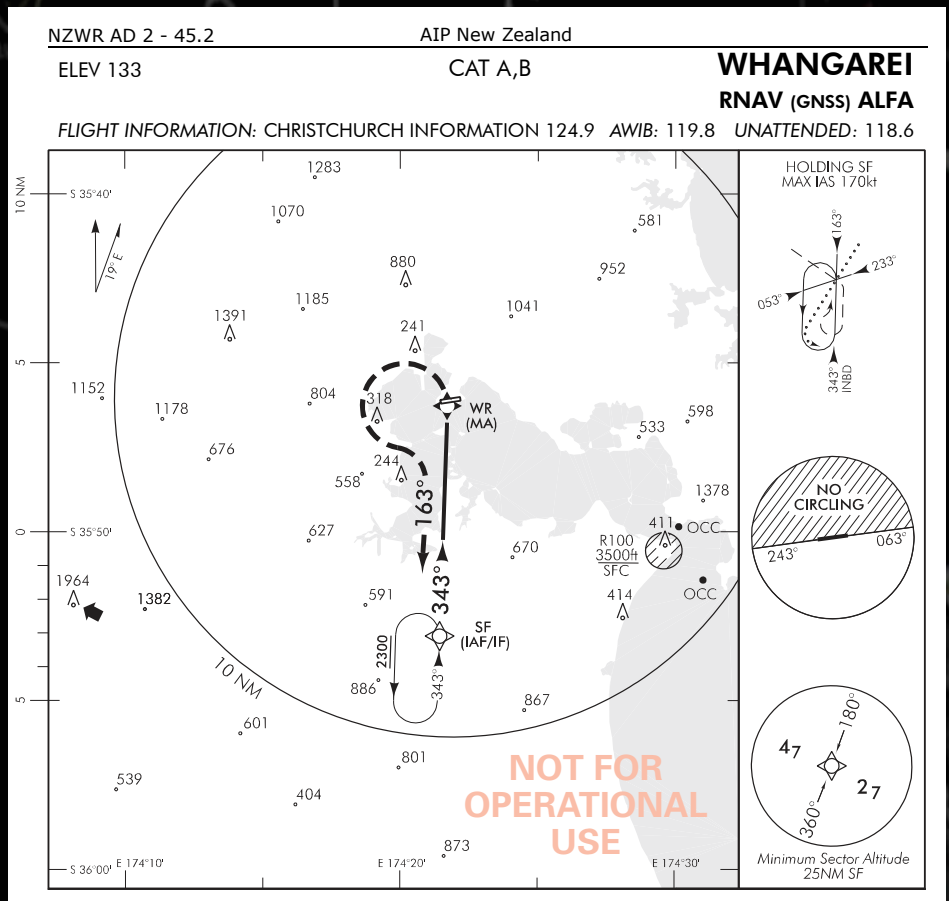


**MISSED APPROACH:** Climb tracking 276° to AUBRY, 018° to BROWN. 119° to TARAX. Hold 7500

## RNAV Missed Approach 2

At the missed approach point you are required to intercept a particular track to the IF. This requires a change from LEG mode to OBS mode.

An example of this is the Whangarei RNAV (GNSS) ALFA, which requires you to make a climbing left turn, then track 163 degrees to SF, which is the IAF/IF. From there, you can start a second approach.



**MISSED APPROACH:** Climbing LEFT turn, track 163° to SF holding 2300



### RNAV Missed Approach 3

Instead of taking you back to the IF, this type of missed approach takes you to a Missed Approach Holding Waypoint (MAHWP) with a hold at the end.

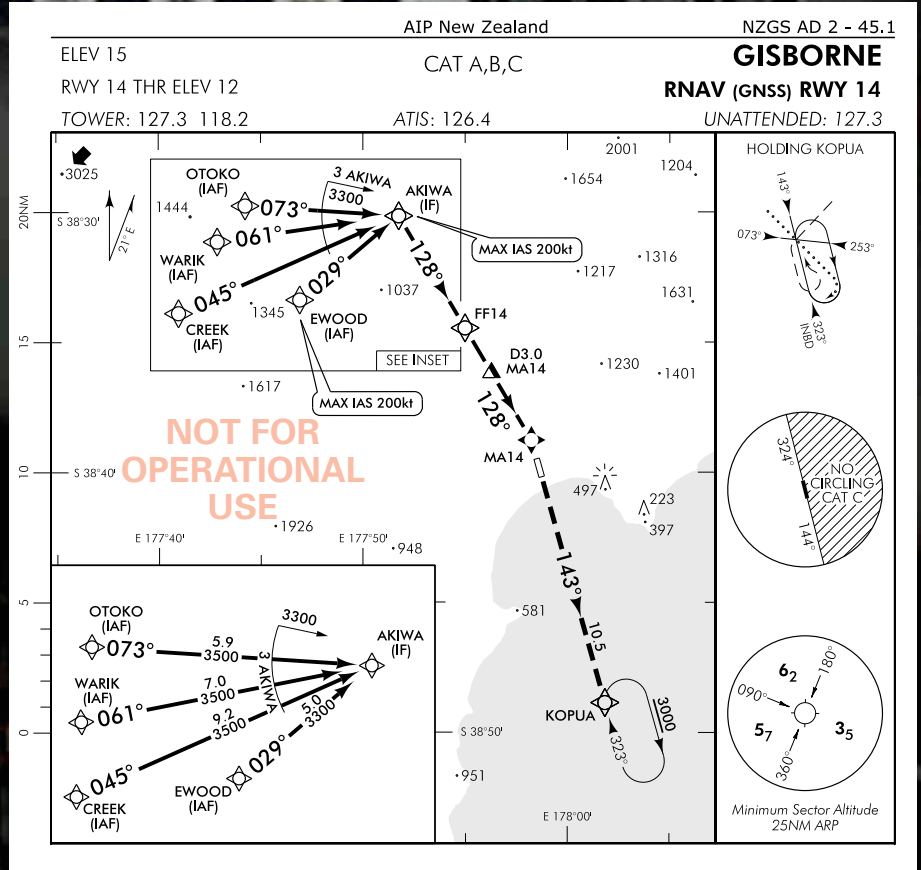
In order to fly another approach, you would need to join the hold while you find and load into your GPS unit an RNAV arrival procedure that will take you back to the IAF.

A good example of this is the Gisborne RNAV (GNSS) RWY 14. The approach begins at one of four IAFs, and the missed approach requires you to track 143 degrees to a MAHWP called KOPUA and enter the hold there. Gisborne has an RNAV arrival procedure that goes from KOPUA to one of the IAFs at EWOOD. You can use this arrival procedure to get back to start another approach.

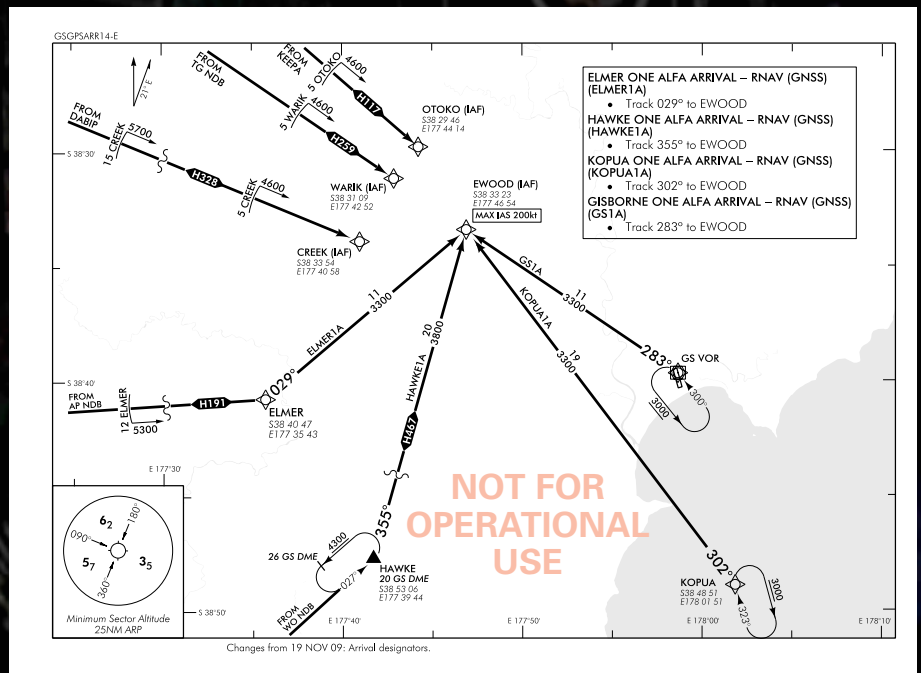
In order to reduce your cockpit workload, you may be able to pre-load the arrival procedure you need to fly to get back to the IAF into the flight plan number two slot in your GPS unit. If you do this before you begin your first approach, it will be there ready to use should you end up missing.

Be aware that you do not have to enter the hold at the end of a missed approach. It is just one option available to you, should you need time to decide what you want to do next.

Continued over >>



MISSED APPROACH: Track 143° to KOPUA 3000



## RNAV Missed Approach 4

If there is no RNAV arrival procedure to take you from the waypoint at the end of the missed approach back to the IAF – what do you do?

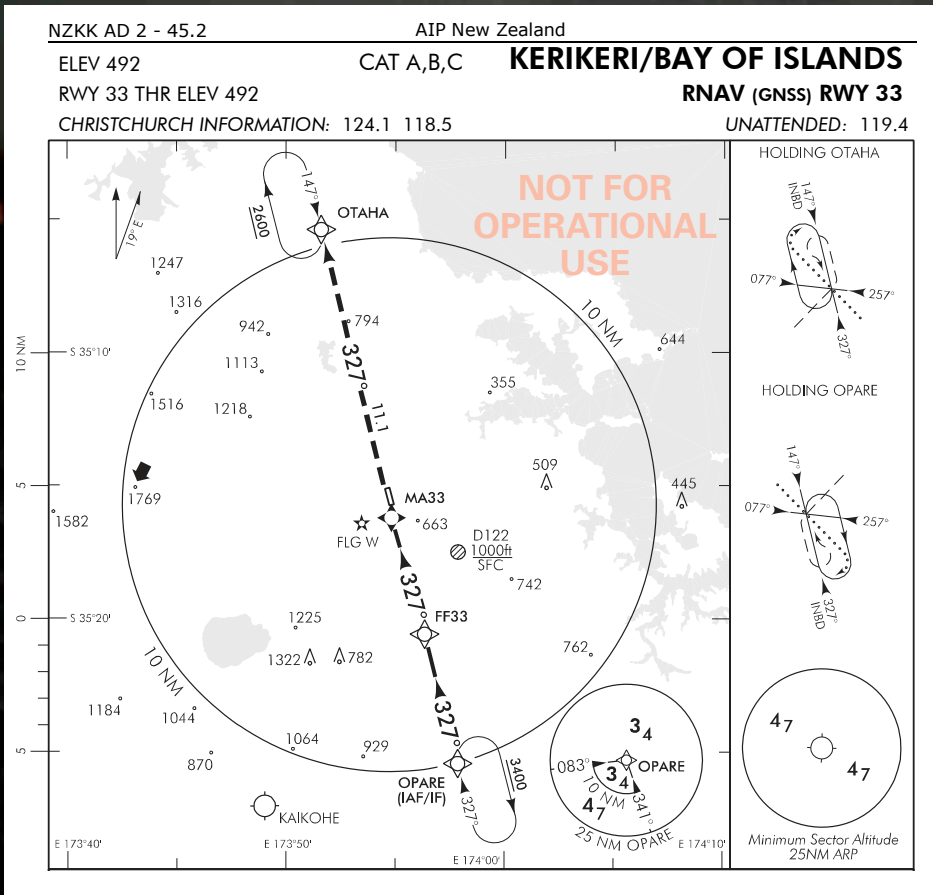
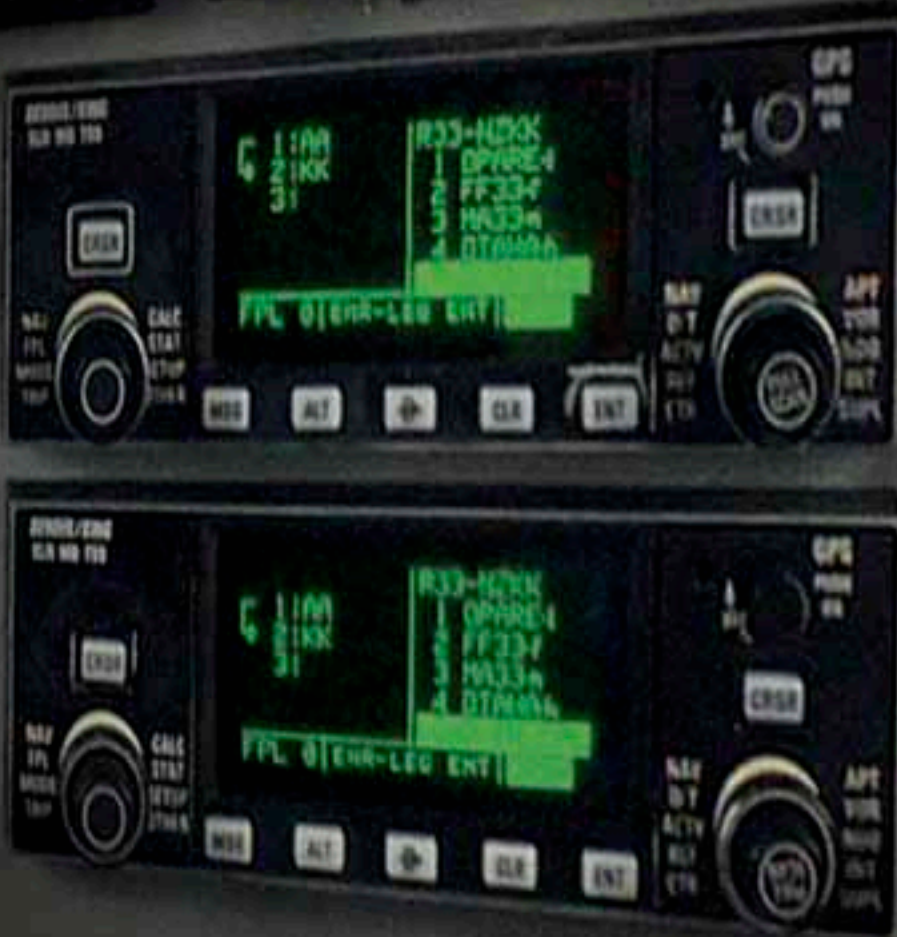
If you were within radar coverage you could be vectored around for another go. If that service is not available, however, you have to figure out for yourself how you are going to get there. It is best to think about this ahead of time.

Your only option is to fly to the Missed Approach Holding Waypoint, enter the hold at the designated altitude for the procedure, climb in the hold to the Minimum Sector Altitude shown on the approach plate (to ensure terrain clearance) track DIRECT TO the IF, enter the hold at the IF, and then descend in the hold to the procedure commencement altitude for the approach.

Take the Kerikeri/Bay of Islands RNAV (GNSS) RWY 33 for example. This approach begins at the IAF/IF OPARE, and the missed approach ends by holding at the Missed Approach Holding Waypoint OTAHA at 2600 feet. In order to get back to OPARE for a second approach, you would have to climb in the OTAHA hold to the Terminal Advisory Altitude of 3400 feet, then track direct to OPARE and enter the hold, from where you could start a second approach.

All RNAV missed approaches are subtly different, so it is important to brief them thoroughly and have good situational awareness of the terrain you are flying over. At all times you need to have a way out in case your GPS unit fails. Have a plan for maintaining terrain clearance.

Also, remember that a GPS unit is only as good as the programmer. You need to be extra vigilant when programming a GPS during a missed approach, because this is a very high workload time. ■



**MISSED APPROACH:** Climb to enter OTAHA holding 2600



# It's Not a Tractor

Bounce a tractor into a ditch or clip it on the side of the shed, and you might see only a chipped patch of paint. Bounce an aircraft into a ditch, or clip the side of the hangar and you might also see only a chipped patch of paint. One might be fine, but the other could be a total loss.

**M**ost objects in life are built to take it – dent your car a bit and you can still drive it safely – not so an aircraft. It's all about design strength. Cars and tractors have wide strength margins, while aircraft do not.

Aircraft are built to withstand sometimes very powerful operating loads, but all from a particular direction or directions. Applying force from an unusual direction or excessive force can cause serious damage that may not be externally obvious.

*Vector* reader Paul Parsons clipped his Garden GY20 on the hangar door this year.

"I suspected something more than paint damage had occurred as there seemed to have been a slight movement of the fairing between the tailplane and fin," Paul says.

"My suspicions were well founded as instead of going for a flight, my 13-year-old son and I removed the tailplane fairing and discovered that the four tailplane mounting bolts had suffered varying degrees of distortion and four upper mounting blocks had fractured."

"My son's disappointment at missing out on his flight evaporated when he realised just how serious the consequences of flying with what initially just looked like a little paint damage would have been."

An aircraft maintenance engineer tells the story of a Cessna 172 that was brought in for its 50-hour inspection. Starting the visual inspection of the engine area, he finds all is well until he gets to the firewall and finds wrinkling on both sides of the nose leg attachment brackets. The battery box attachment angles have buckled and the firewall step beneath is distorted. Externally, the nosewheel tyre, wheel fairing, cowling and propeller are fine and the nose wheel strut is not deflated. Hearing of the damage, the owner remembers landing on a strip earlier in the week and running through a dip in the ground that he thought was 'a bit rough'. But as there was no obvious external damage he had considered the aircraft airworthy.

These are not unusual tales. The severity of events is very subjective and as most objects in our lives are built with big strength margins, it can be difficult for non-engineer pilots to recognise the potential damage caused by a seemingly minor event.

Consider this – your aircraft is less John Deere, and more Formula 1. ■





# Part 115 Coming Soon

If you plan to run an adventure aviation business, proposed new rules could be your chance to enter the New Zealand civil aviation system.

**A** notice of proposed rule-making (NPRM) for Part 115 *Adventure Aviation – Certification and Operation*, is expected to be published in September 2010. The NPRM will be open for public comment for six weeks after publication, and is expected to come into force in October 2011.

The NPRM lists the proposed requirements for the certification of adventure aviation operators and the rules for conducting ongoing operations.

Once certificated under Part 115, operators become part of the NZ civil aviation system.

Part 115 will apply to more than 50 operators who are currently conducting adventure aviation operations for hire or reward.

This includes hot air ballooning, glider and glider tow operations, tandem parachute and parachute-drop aircraft operations, tandem hang glider and paraglider, and hang glider tow

operations. It will also apply to A to A flights (those that take off and land in the same place) in aircraft issued with certain special category airworthiness certificates (Primary, LSA and Limited); A to A flights in an aircraft issued with a standard category airworthiness certificate conducting formation flight, aerobatic manoeuvres, and similar non-standard flight manoeuvres, such as steep climbs, steep descents and steep turns; and A to A flights in micro-light aircraft.



Part 115 will apply to more than 50 operators who are currently conducting adventure aviation operations for hire or reward.

## Flashback to 1999

A Part 115 NPRM was first published in 1999. However, the project was suspended by the Director in June 2002 due to changes in the CAA's priorities.

In 2003, following industry concerns that adventure aviation safety standards were lower than those required for Part 135 air operators, Part 115 was re-introduced into the rule development programme.

### Differences from Previous NPRM

The current Part 115 NPRM is noticeably different to the NPRM published in 1999. The 2010 NPRM is more closely based on Parts 119 and 135 than was its predecessor, and adventure aviation has been redefined to more accurately account for current and future operations.

Several activities that were included in the original 1999 NPRM, such as helicopter rappelling, helicopter suspended human external load operations, and helicopter bungy jumping are not included in the current NPRM as they are now considered to present an unacceptable safety risk.

### Staged Transition

Staged transitional arrangements from October 2011 are proposed for adventure aviation operators who can currently conduct operations under Part 101 *Gyrogliders and Parasails*; and *Umanned Balloons, Kites, Rockets, and Model Aircraft*, Part 103 *Micro-light Aircraft – Operating Rules*, Part 104 *Gliders – Operating Rules*, Part 105 *Parachuting – Operating Rules*, and Part 106 *Hang Gliders – Operating Rules*.

The transitional arrangements vary, depending on the estimated level of safety risk and potential social cost each activity poses.

Hot air balloon operators, tandem parachute operators, hang glider, and paraglider operators would have to be certificated within six months of Part 115 coming into force. Microlight aircraft operations would have to be

certificated within 12 months. Glider operations would have 18 months.

After Part 115 is in force any new adventure aviation business must be certificated under the rule before starting operations.

Part 115 has similar certification requirements to those currently required of air transport and commercial transport operators, certificated under Part 119 *Air Operator – Certification*/Part 135 *Air Operations – Helicopters and Small Aeroplanes*.

Under Part 115 operators will need to provide expositions and demonstrate that:

- » they have appropriate management systems, structures, and operating procedures in place to ensure they comply with the relevant safety standards;
- » their employees are appropriately qualified, and trained;
- » their equipment is appropriate to the task and properly maintained; and
- » their key people are fit and proper to undertake their responsibilities.

Once published, the NPRM will be added to the CAA web site. You can subscribe to be notified via email that it has been published. Go to [www.caa.govt.nz](http://www.caa.govt.nz), Quick Links, "Email Notification Service". ■

# In the Drink

A ditching is a water landing made under control, rather than a crash into water.

A perfectly executed ditching can still result in fatalities. It is an extremely hazardous manoeuvre, and should be considered only as a last resort, but being prepared will greatly improve the outcome.

Pilots need to know how to develop a flexible plan, prepare the cabin, make a distress call, carry out the water landing in the right direction, and survive in the water.

A new Advisory Circular offers this guidance. While it has been written for Part 125 *Air Operations – Medium Aeroplanes* operators, much of the information is relevant to anyone who flies over water, regardless of size of aircraft, amount of water or proximity to shore.

All pilots and operators should read it and start to formulate their own plan.

## Surface Conditions

The ability of an airframe to remain intact after a ditching depends largely on the surface conditions. Two ditchings in 2009 illustrate this. When an Israel Aircraft Industries Westwind ditched in bad weather, in the open ocean near Norfolk Island, the impact damaged the main door making it unusable and the fuselage quickly filled with water. The passengers and crew only just managed to get clear before the aeroplane sank.

In a rough sea there is a strong possibility that the airframe may break up on impact. The airframe of larger aeroplanes is likely to break into at least 2 pieces, breaking the fuselage at the front and/or rear of the wing root structure.

In contrast, the ditching of an A320 in the relatively calm Hudson River, New York, resulted in little damage to

the airframe. The aeroplane floated in a reasonably level attitude for a significant amount of time.

## Cabin Preparation

If you have time, here are some important ways to prepare the cabin. Loose items in the cabin and flight deck become missiles on impact, and then become floating debris as water enters the aircraft, hindering evacuation. Secure everything.

Put on available extra clothes prior to ditching, to reduce the effects of hypothermia after entering the water. Do not put large loose items of clothing on, such as overcoats. These could become snagged when exiting the aircraft.

Brief passengers well. Make it very clear that they should not inflate lifejackets until they are outside the aircraft.



## Water Landing Techniques

### Power

Ideally, the decision to ditch should be made while power is still available so you can control the aeroplane's rate of descent, and therefore choose the actual touchdown point.

### Aeroplane Configuration

Use the configuration given in the Flight Manual or Flight Crew Operating Manual unless safety dictates otherwise. Generally, this will be gear up, maximum flap, and minimum approach speed.

### Direction of Ditching

Always follow the manufacturer's recommended procedure. If none is provided then:

- » In lakes and small bodies of water, land into wind, parallel and close to shore if possible. Terrain or obstacles near the shore may dictate otherwise.
- » In large bodies of water, if the water is smooth or there are long swells, land into wind.

If there are breaking waves or large swells, land along the swell, accepting the crosswind and higher touchdown

speed. Land on the top of the swell, or on the back of the swell. Try to avoid a touchdown on the advancing face of the swell.

Endeavour to land with the airframe aligned with the direction of travel. This may require considerable correction for drift in strong crosswinds. This will reduce the side loads on the fuselage structure, giving you a better chance of maintaining structural integrity.

### Surface Contact

Use minimum rate of descent so that gentle contact is made with the surface.

The optimum landing attitude for most types is about 10 degrees pitch up, unless otherwise specified by the manufacturer.

Try to ensure the wings are level, so they contact the water simultaneously. If one wing tip touches first, it can induce a large slewing motion, resulting in further loss of control and a violent impact.

Some fixed undercarriage aeroplanes will violently pitch nose down on impact, causing the nose section to go well underwater. This may be less

violent, however, in aeroplanes with a significant portion of their structure in front of the main wheels.

### Evacuation

Some aeroplanes float nose high, and therefore sink tail first, so be very careful using the rear doors to evacuate. Even using over-wing exits may not be advisable. If this area is already immersed when the exits are opened, the fuselage will rapidly fill with water and considerably reduce the floating time of the airframe.

### Hypothermia

Cold water robs the body's heat 32 times faster than cold air. Physical exercise, such as swimming or treading water causes the body to lose heat at a much faster rate than remaining still. It can shorten your survival time by more than 50 percent, because blood is pumped to the extremities and quickly cooled. Do not attempt to swim further than 2 km, even if you are a strong swimmer.

Survivors should huddle together in groups of four, facing each other, with upper and lower bodies pressed together to maintain body heat. Place children in the middle of the huddle. ■

### Learn more

New Advisory Circular 125-2 *Ditching – Techniques, Hazards, and Survival: A Basis for Assessing Risk* is available free on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), under "Advisory Circulars".

# A Taste of Mountain Flying



If terrain prevents you from flying from point A to point B in a straight line – you are mountain flying. Every pilot in New Zealand needs mountain flying techniques and skills because no one is ever far from terrain, or its influence.

**T**his year the CAA presented 29 AvKiwi Safety Seminars on Mountain Flying to 2485 pilots around New Zealand. Here is an overview for those who missed it.

## Threats

Terrain is the most obvious threat in the mountains, but with knowledge, training, experience, and respect, this threat can be mitigated. Here are a few others:

### Lack of Horizon

The horizon is the line where the sky meets the sea. Without a defined horizon, it is difficult to maintain a consistent aircraft nose attitude. Carlton Campbell, CAA Training Standards Development Officer and co-presenter of this year's AvKiwi Safety Seminars, says pilots should overlay an imaginary horizon by visualizing where the real

horizon would sit if the terrain or weather around them was transparent.

“Learning to superimpose an imaginary horizon on any background is not an innate ability. It is a skill that must be learnt. It generally takes the average pilot five hours of training and practice to achieve this with reasonable accuracy.”

### Visual Illusions

The mind can be fooled in the mountains. Different lighting conditions can create definition and depth perception problems, and in winter, snow cover makes it even harder to determine if what you see is real.

» Bright sunlight can cause areas of deep shadow that are impossible to see into. If you are aware of the sun's position, you can avoid being surprised by bright light as you come around a ridge or peak.

» An overcast sky while flying over snow can cause 'whiteout'. If the snow, sky, and cloud are the same colour, all trace of surface texture and terrain definition is hidden. It becomes impossible to judge height, gradient, and distance, see patches of lower cloud, or determine what is terrain and what is cloud.

Other illusions include terrain in the foreground merging into, and appearing part of more distant terrain, as well as difficulties judging gradient, scale, and how much space you have available.

### Wires and Structures

Wires can be particularly hard to see when they span valleys, and wind farms and masts are often installed in mountainous areas.

### Wind and Turbulence

Assess the strength and direction of the wind and plan your route for the smoothest ride. Use wind shadows on



water, cloud formations, wind on crops, trees and tussocks, smoke and dust, and interpretation of drift and ground-speed.

If you imagine the airflow as water, it can help you figure out how the wind will behave at different points along your route. Think about how it will flow over the terrain; where it will accelerate through passes, divert along valley floors or be forced over a ridge. Rapids (or turbulence) will occur where flows mix together, and where deceleration occurs in the lee of obstacles. Below 15 knots, wind flows are generally predictable. Above 15 knots, wind becomes more difficult to predict. If you are inexperienced or uncurrent, and the wind is stronger than 15 knots, consider either staying on the ground or avoiding flight amongst terrain.

### Cloud

The lower the cloud, the more restricted your options, and the more you will confront other traffic. Understanding what conditions are required to produce different cloud types will help you to figure out what flying conditions may be like in that area. Be aware that the terrain creates its own weather. This can be very changeable and limit your escape options.

### Other Aircraft

Traffic can be harder to see in the mountains, and everyone can be exactly where you want to be – especially if you have all figured out the smoothest line to take, or you are forced down into the same valley systems by cloud.

## Aircraft Performance and Your Performance

At altitude, your performance and the aircraft's performance are both degraded. Never rely on aircraft performance to get you out of trouble – only good decision-making will do that.

Density altitude calculations are particularly important for helicopter pilots. The density altitude for a particular landing site can vary depending on the ambient conditions. Just because a landing was successfully made on one particular day, doesn't mean it will be achievable on another.

Here is a sample density altitude calculation:

- » On a standard day, sea level pressure is 1013 hPa and the temperature 15 degrees.
- » At 5000 feet, the temperature should be 5 degrees, because the temperature lapse rate is 2 degrees per 1000 feet.
- » If the temperature at 5000 feet is actually 15 degrees, then it is 10 degrees warmer than standard and the density altitude will be greater.
- » To calculate density altitude, multiply the temperature difference by the lapse rate.  $10 \text{ degrees} \times 120 \text{ feet per degree} = 1200 \text{ feet}$ .
- » So, at 5000 feet with a temperature of 15 degrees, the density altitude is 6200 feet.

Don't forget the effects of pressure altitude. Many aerodromes in New Zealand are high enough for this to have a considerable impact on your aircraft's performance, particularly on hot, low pressure days.

## Route Planning

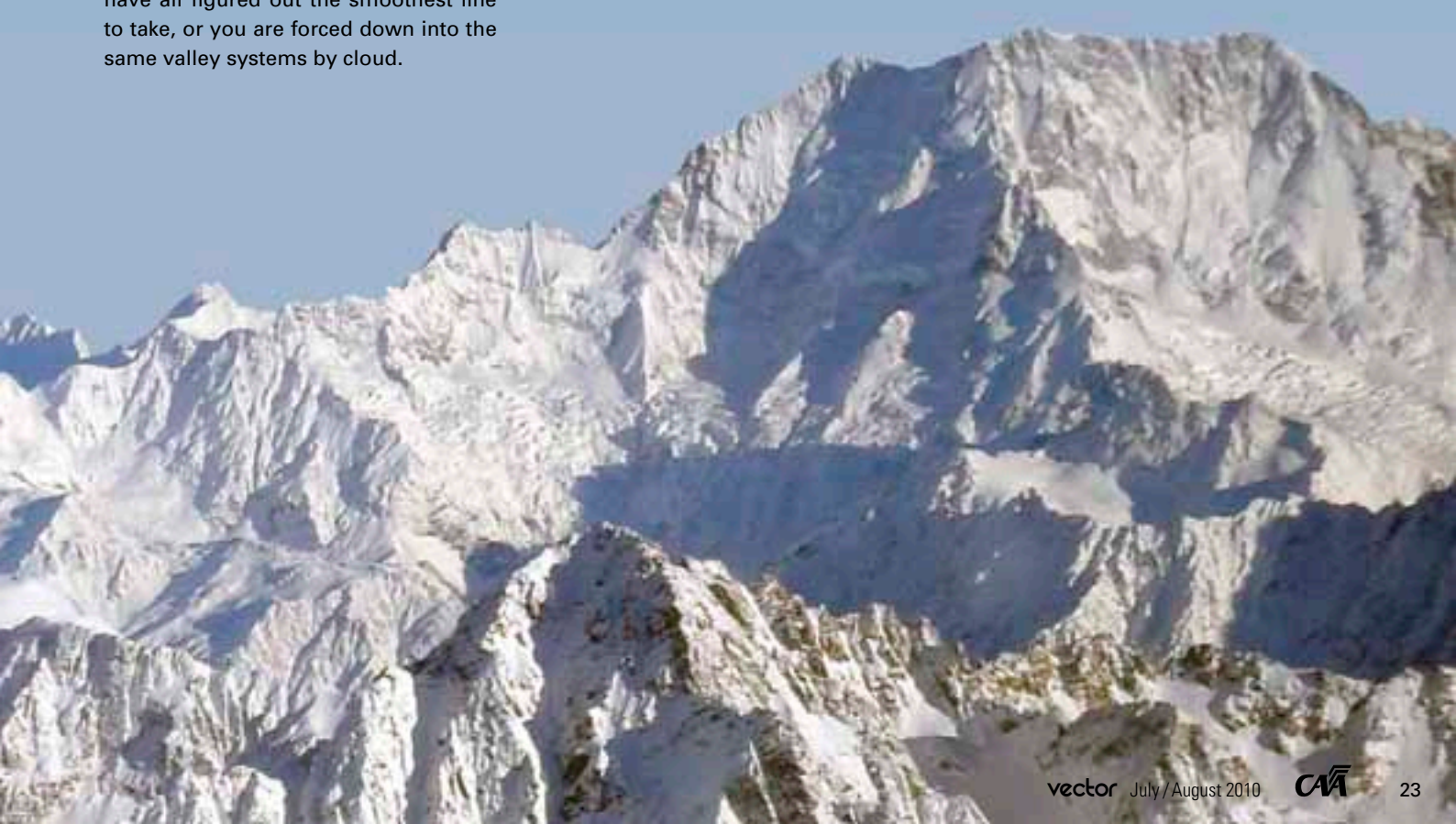
There are always a number of different routes you can take – which one to choose will generally depend on the weather. One route may be safer or more comfortable in north-westerly conditions, for example, but unsafe or extremely turbulent in south-easterly conditions. Seek local knowledge.

## Syllabus Changes are Coming

Changes have already been incorporated in the helicopter training syllabus, and promulgated fixed wing syllabus changes are coming in 2011. These will require anyone training for a PPL or CPL to undergo specific terrain awareness and mountain flying training with an appropriately qualified instructor.

## You Need Training

If you already have a licence, ask for mountain flying training at your next BFR. Attending this year's AvKiwi Safety Seminar, and watching the CAA's new *Mountain Flying* DVD is not enough – you need training. Invest in your skills – you don't know what you don't know. ■



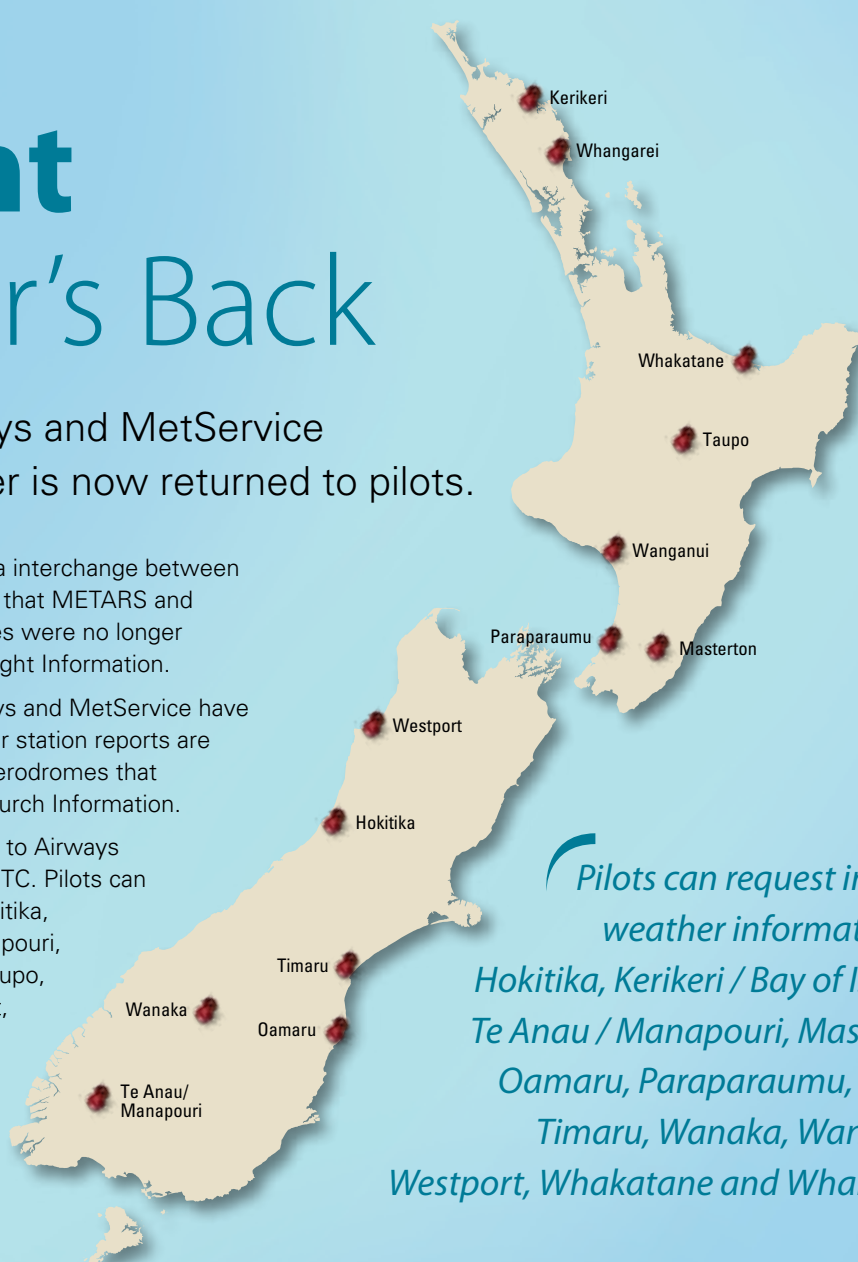
# In-flight Weather's Back

A deal between Airways and MetService means in-flight weather is now returned to pilots.

Late last year changes in the data interchange between MetService and Airways meant that METARS and TAFs for unattended aerodromes were no longer available for pilots on request from Flight Information.

With facilitation from the CAA, Airways and MetService have devised a solution. Automatic weather station reports are now available for those unattended aerodromes that have scheduled services, via Christchurch Information.

MetService will provide these reports to Airways half hourly between 1700 and 0800 UTC. Pilots can now request weather in-flight for Hokitika, Kerikeri/Bay of Islands, Te Anau/Manapouri, Masterton, Oamaru, Paraparaumu, Taupo, Timaru, Wanaka, Wanganui, Westport, Whakatane and Whangarei. ■



*Pilots can request in-flight weather information for Hokitika, Kerikeri / Bay of Islands, Te Anau / Manapouri, Masterton, Oamaru, Paraparaumu, Taupo, Timaru, Wanaka, Wanganui, Westport, Whakatane and Whangarei.*

## Unmanned Aerial Systems Seminar

The CAA is hosting a day-long seminar in August 2010 to highlight developments in the field of unmanned aerial systems.

Unmanned aerial systems (UAS) include an unmanned aerial vehicle (UAV), a control station and ground-based operating crew. A UAV can be as small as an insect or as large as a 737. A small UAV differs from a model aircraft in that it is used for commercial purposes.

There has been increasing interest in the possibility of operating UASs in recent years. The CAA seminar aims to bring together commercial companies involved in the field, and those who intend to use the devices, such as the Police and the Defence Force, as well as individuals with a special interest in the topic.

Manager Sport and Recreation, Rex Kenny, says the seminar will allow both the CAA and the industry to learn where each other is at.

"We will be launching a new draft Advisory Circular on the day. AC19-2 *Pilotless Aircraft and Unmanned Aerial System* provides guidance on getting authorisation to operate in New Zealand. It will also clarify the limitations and restrictions that apply."

Another highlight will be an overview of the international obligations that apply to large UASs weighing over 150 kg, presented by Australia's Civil Aviation Safety Authority Manager Sport and Future Technology, Jim Coyne. Mr Coyne is also chairman of the International Civil Aviation Organisation's Unmanned Aerial Systems study group.

The free seminar will be held in Wellington on 12 August 2010. For details and to register contact Manager Sport and Recreation, Rex Kenny, email: [rex.kenny@caa.govt.nz](mailto:rex.kenny@caa.govt.nz), or go to the CAA web site under "Sport and Recreation". ■



# AIP New Zealand Price Increase

The retail prices of new *AIP New Zealand, Vol 1* purchases and Volumes 1 and 4 amendment services are going up from 1 August 2010. This is the first increase since 2003. The prices of all other hard copy *AIP New Zealand* products and subscriptions remain unchanged. Also, from 1 October 2010, *AIP New Zealand* prices will increase to reflect the new GST rate of 15 percent.

AIP content from Volumes 1, 2/3, 4 continue to be available free at [www.aip.net.nz](http://www.aip.net.nz). Direct any queries to Tel: 0800 500 045, [aim@airways.co.nz](mailto:aim@airways.co.nz).

AIP New Zealand Product (single purchase)	Retail price (inc GST at 12.5 percent)	
	Until 31 July 2010 (current price)	From 1 August 2010 (new price)
Volume 1 (without amendment service)	\$60	\$72
AIP New Zealand Amendment Service (1 year)	*Retail Price (inc GST at 12.5 percent)	
	Expires before 31 July 2010 (current price)	Expires after 1 August 2010 (new price)
Volume 1 amendment service only	\$55	\$87
Volume 4 amendment service only	\$55	\$77

\* Amendment service price includes postage if shipped to an NZ address

## October GST Increase

# 15%

From 1 October 2010, GST will increase to 15 percent. This will increase all of the CAA's fees, levies and charges. All of the revised amounts will be published on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), before 1 October 2010. You can subscribe to receive an email notification when the revised amounts are published. Go to the CAA web site under "Email Notification Service".

## Aviation Safety Advisers

Aviation Safety Advisers are located around New Zealand to provide safety advice to the whole aviation community. You can contact them for information and advice.

### Don Waters

(North Island)  
Tel: 0-7-376 9342 Fax: 0-7-376 9350  
Mobile: 027-485 2096  
Email: [watersd@caa.govt.nz](mailto:watersd@caa.govt.nz)

### Murray Fowler

(South Island)  
Tel: 0-3-349 8687 Fax: 0-3-349 5851  
Mobile: 027-485 2098  
Email: [fowlerm@caa.govt.nz](mailto:fowlerm@caa.govt.nz)

### John Keyzer

(Maintenance, North Island)  
Tel: 0-9-267 8063 Fax: 0-9-267 8063  
Mobile: 027-213 0507  
Email: [keyzerj@caa.govt.nz](mailto:keyzerj@caa.govt.nz)

### Bob Jelley

(Maintenance, South Island)  
Tel: 0-3-322 6388 Fax: 0-3-322 6379  
Mobile: 027-285 2022  
Email: [jelleyb@caa.govt.nz](mailto:jelleyb@caa.govt.nz)

## How to Get Aviation Publications

### AIP New Zealand

*AIP New Zealand* is available free on the internet, [www.aip.net.nz](http://www.aip.net.nz). Printed copies of Vols 1 to 4 and all **aeronautical charts** can be purchased from Aeronautical Information Management (a division of Airways New Zealand) on 0800 500 045, or their web site, [www.aipshop.co.nz](http://www.aipshop.co.nz).

### Pilot and Aircraft Logbooks

These can be obtained from your training organisation, or 0800 GET RULES (0800 438 785).

### Rules, Advisory Circulars (ACs), Airworthiness Directives

All these are available free from the CAA web site. Printed copies can be purchased from 0800 GET RULES (0800 438 785).

## Planning an Aviation Event?

If you are planning any aviation event, the details should be published in an *AIP Supplement* to warn pilots of the activity. For *Supplement* requests, email the CAA: [aero@caa.govt.nz](mailto:aero@caa.govt.nz).

To allow for processing, the CAA needs to be notified **at least one week** before the Airways published cut-off date.

Applying to the CAA for an aviation event under Part 91 does not include applying for an *AIP Supplement* – the two applications must be made separately. For further information on aviation events, see AC91-1.

CAA Cut-off Date	Airways Cut-off Date	Effective Date
9 Aug 2010	16 Aug 2010	21 Oct 2010
6 Sep 2010	13 Sep 2010	18 Nov 2010
4 Oct 2010	11 Oct 2010	16 Dec 2010

## Aviation Safety & Security Concerns

Available office hours (voicemail after hours).

**0508 4 SAFETY**  
(0508 472 338)

[info@caa.govt.nz](mailto:info@caa.govt.nz)

For all aviation-related safety and security concerns

## Accident Notification

24-hour 7-day toll-free telephone

**0508 ACCIDENT**  
(0508 222 433)

The Civil Aviation Act (1990) requires notification "as soon as practicable".

# Accident Briefs

More Accident Briefs can be seen on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), "Accidents and Incidents".  
Some accidents are investigated by the Transport Accident Investigation Commission, [www.taic.org.nz](http://www.taic.org.nz).

## ZK-FNX Cessna A185E

Date and Time:	2-Jan-09 at 17:05
Location:	Haruru Falls
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Parachuting
Pilot Licence:	CPL (Aeroplane)
Age:	22 yrs
Flying Hours (Total):	529
Flying Hours (on Type):	182
Last 90 Days:	184

On landing at Haruru Falls after a parachute drop run, the aircraft touched down on the left main wheel first due to a light cross wind component present. Once the right main wheel made contact with the ground, the aircraft instantly started to nose over. The pilot applied full back pressure on the elevator but the rate of nose over continued to increase rapidly. The propeller struck the ground before the pilot was able to put on any power and the aircraft flipped on its back.

CAA Occurrence Ref 09/8

## ZK-BQL Auster J5

Date and Time:	21-Mar-09 at 9:45
Location:	Fairfield Downs
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	PPL (Aeroplane)
Age:	67 yrs
Flying Hours (Total):	3316
Flying Hours (on Type):	317
Last 90 Days:	40

The pilot aborted the takeoff just after becoming airborne, due to the engine running rough and losing power. There was insufficient distance to stop the aircraft before colliding with a fence at the end of the private airstrip. Maintenance investigation found that one spark plug was inoperative when tested. This most likely would have caused the aircraft symptoms that the pilot experienced during takeoff.

CAA Occurrence Ref 09/1042

## ZK-MJN North American Harvard 2A\*

Date and Time:	18-Jan-09 at 16:30
Location:	Masterton
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	PPL (Aeroplane)
Age:	48 yrs
Flying Hours (Total):	823
Flying Hours (on Type):	446
Last 90 Days:	26

The aircraft was landing on Runway 28 at Masterton at the completion of a display sequence for the Wings over Wairapa airshow. The wind was from 310 at 13 knots gusting 17 knots. The pilot elected to land 100 metres into the runway due to a fire (caused by a pyrotechnic show as part of the display) that had just been extinguished adjacent to the runway. The landing was normal until crossing sealed Runway 06/24 when the aircraft ground looped to the right onto the seal taxiway, coming to rest in front of the crowd line.

The aircraft suffered damage to the wing tip, aileron and a bent oleo leg. Investigations revealed that the show organisers have procedures in place to minimise the risk of ground loops when using Runway 28 during the show.

CAA Occurrence Ref 09/22

## ZK-FRL Piper PA-28-161

Date and Time:	22-Mar-09 at 16:30
Location:	Raglan
POB:	3
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	PPL (Aeroplane)
Age:	42 yrs
Flying Hours (Total):	155
Flying Hours (on Type):	15
Last 90 Days:	15

During the takeoff run, the pilot did not feel that the aircraft was performing as he expected, and he chose to abort the takeoff. There was insufficient distance remaining to stop the aircraft before it collided with the boundary fence, damaging the wing and propeller. Prior to takeoff the pilot had calculated the takeoff weight; using the performance chart he calculated that a distance of approx 400 metres was required for takeoff. During his calculation, he had made an error and the actual distance required was 620 metres. TODA was 646 metres. During the subsequent takeoff run, the aircraft did not become airborne in the distance that the pilot had calculated or expected, so he chose to abort the takeoff.

CAA Occurrence Ref 09/1043

# GA Defects

GA Defect Reports relate only to aircraft of maximum certificated takeoff weight of 9000 lb (4082 kg) or less. More GA Defect Reports can be seen on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), "Accidents and Incidents".

## Key to abbreviations:

<b>AD</b> = Airworthiness Directive	<b>TIS</b> = time in service
<b>NDT</b> = non-destructive testing	<b>TSI</b> = time since installation
<b>P/N</b> = part number	<b>TSO</b> = time since overhaul
<b>SB</b> = Service Bulletin	<b>TTIS</b> = total time in service

## Cessna 182T

### Wheel fairing

Part Model:	182T
Part Manufacturer:	Cessna
Part Number:	0741646-13
ATA Chapter:	3200
TSI hours:	40
TTIS hours:	240

Both main landing gear wheel fairing outboard attachments were found broken by the operator. The maintenance provider comments that the outboard attachment brackets are not of sufficient strength to support the weight and contend with the vibration of the undercarriage during landing and takeoff. Two other Cessna 182T aircraft have had the same defect with one destroying the fairing when it tore away from its mountings. The brackets were replaced on each occasion and the manufacturer has been advised.

[CAA Occurrence Ref 09/4284](#)

## Pacific Aerospace Cresco 08-600

### Spar doubler

ATA Chapter:	5710
TTIS hours:	6390

During a routine maintenance inspection, the doubler at the inboard top end of the rear spar was found to be cracked. The doubler was removed and the spar inspected, no defects found. A new doubler was fitted. The maintenance provider suspects the cause of the cracked doubler to be metal fatigue due to the aileron hinge inboard end being poorly installed, leading to excessive flexing at the inboard end of the spar. A new aileron hinge was installed with the correct alignment.

[CAA Occurrence Ref 09/4265](#)

## Partenavia P 68B

### Pipeline

ATA Chapter:	7310
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Approximately 3 minutes into cruise with cruise power set (2300/24"), the right hand engine suddenly lost power, then surged back up again. About 10-15 seconds later the event occurred again, at which time the power was reduced to 15" and the fuel booster pump turned on, however the engine continued to surge. Climb power was selected on the left engine and the right engine

was reduced to idle at which it ran satisfactorily. The aircraft returned to the departure aerodrome for an uneventful landing. This was the second occurrence of this problem.

During maintenance investigation it was found that the fuel line from the electric auxiliary fuel pump outlet to the engine mechanical pump inlet was positioned such that it lay on the aluminium muff which surrounds the exhaust pipe running across the rear of the engine. The fuel pipeline should have been routed so that it was not in contact with any heat source. It is possible that heating of this hose could lead to vapour developing in the fuel line which would result in erratic fuel servo regulating operation. The fuel pump inlet fitting was rotated 120 degrees from its original position and the inlet hose repositioned to provide clearance from both the exhaust muff and the engine oil sump. The aircraft was released for a flight back to the maintenance base. A final operational flight check was carried out before releasing the aircraft back into normal service.

[CAA Occurrence Ref 09/4293](#)

## Britten-Norman BN2A-20

### Ceiling panel

ATA Chapter:	5710
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The pilot heard a noise in the cabin after receiving clearance to commence the approach. On taking a look behind the pilot's seat, he noticed that a panel was missing from the aircraft's ceiling. The panel would have flown from the rear left door of the aircraft (normally kept open during descent). The operator notes that this is the first occurrence of this in five years of parachute operations. The panel is fitted into rails in the aircraft and to assist in the security of the panels a screw has been incorporated to prevent further recurrence.

[CAA Occurrence Ref 09/3994](#)

## Cessna 172N

### Microswitch

ATA Chapter:	2750
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A student and instructor were carrying out circuit training. After the first touch and go the student noticed that the flaps had not retracted and had remained at 30 degrees. At this point the aircraft was already airborne so the instructor decided to continue with the circuit. Trouble shooting involved checking the circuit breaker and recycling the flap selector.

Recycling the flap selector made the problem worse as the instructor selected 40 degrees in an attempt to see if they would retract from there, but instead the flap lowered normally to 40 degrees but would not retract. The aircraft was flown around the circuit with the flap down and a normal landing was carried out. The flaps were working correctly when checked during the pre-flight inspection. The aircraft was inspected by engineering. The flap "up" travel micro switch was found to be faulty and replaced. The flap operation was checked and the aircraft was returned to service.

[CAA Occurrence Ref 09/4191](#)

# 2485 Attend AvKiwi Safety Seminar on Mountain Flying

The 2010 series of AvKiwi safety seminars were a runaway success. A record number of pilots, instructors, air traffic controllers, aircraft owners and operators attended the 29 seminars held around the country. A result like this could not have been achieved without support from Flying Schools and Aero Clubs, who have really embraced the AvKiwi concept. Everyone who came along received a free copy of the CAA's new *Mountain Flying* DVD.

If you missed out on attending one of these seminars make sure you...

- » Read the article about Mountain Flying on page 22 of this issue of *Vector*. This summarises many of the important points covered in the seminar.
- » Borrow the *Mountain Flying* DVD for free from the CAA library. Just email [info@caa.govt.nz](mailto:info@caa.govt.nz) with your name, client number and address, or
- » Purchase a copy by emailing: [viv@videonz.co.nz](mailto:viv@videonz.co.nz) – cost \$35, plus \$10 postage.
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