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POINTING TO SAFER AVIATION

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CIVIL AVIATION AUTHORITY OF NEW ZEALAND

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Hire or Reward Under Part 91

Operating under Part 91 does not mean that you are necessarily operating 'privately'. Hire or reward operations can be conducted under Part 91.

Aircraft Certification Changes

We give you pointers to get your aircraft certification changed from the Experimental category, to one of the six possible categories in the revised Part 21, by the deadline of 3 December 2010.

Performance-Based Navigation

Performance-Based Navigation will move the aviation industry away from traditional ground-based navigation systems, to greater dependence on satellite-based airborne navigation technology.

AvKiwi Safety Seminars

This year's AvKiwi Safety Seminars on Mountain Flying kick off in Tauranga at SportAvex on 6 February 2010. This is followed by the South Island series, starting 1st March.

In this issue...

Cover: There are 77 examples of the Rans RV series of amateur-built aircraft on the New Zealand register. These two RV-7As, and the other 75, will need to transition to the new amateur-built certification category by 3 December 2010. Photo: Gavin Conroy

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Hire or Reward Under Part 91

Part 91 operations are not necessarily private operations. Part 91 *General Operating and Flight Rules* sets the basic standard that other Parts build on. It is not 'private operations', as some may think.

Whenever there is a hire of an aircraft, or a reward is received, then the operation is considered to meet the definition of hire or reward. An aircraft can be operated for hire or reward under Part 91.

Hire or Reward

To determine if you are operating for hire or reward, you need to look at the definition of hire and the definition of reward.

The word hire means engaging the services of a person, or the use of a thing for payment. It is important to note that money is not the only determining factor when deciding if there was a hire. Payment does not necessarily have to be in money.

A reward is a return, or recompense, for service or merit. Money does not need to change hands in order for it to be considered a reward.

The operation stops being a Part 91 hire or reward operation as soon as any **passengers** or **goods** are carried. This then falls under the definition of an "air operation" (see Part 1 *Definitions and Abbreviations*) and requires the flight to be conducted under an Air Operator Certificate (AOC) issued under Part 119 *Air Operator – Certification*.

There is a provision for equally sharing the costs of a private flight. See Part 1 *Definitions and Abbreviations*.

One example of a Part 91 hire or reward operation is flight training.

Flight Training

Flight training carried out under Part 91 is a hire or reward operation when the student is paying for the flight.

Instructors and students are not considered passengers, and there are no goods carried, therefore an instructional flight is not required to be undertaken under an AOC and can operate under Part 91.

Frost Protection

Frost protection is another example of a hire or reward operation that can be carried out under Part 91 – as long as the only person on board the helicopter is the appropriately qualified pilot. As soon as the pilot puts another person in the helicopter, for example the vineyard/orchard owner, then they are carrying a passenger on a hire or reward flight, and the flight would need to be conducted under a Part 119 certificate.

Maintenance

Maintenance standards are an important consideration with Part 91 hire or reward operations. If you are conducting hire or reward operations under Part 91, then your maintenance programme must reflect this. In particular, you will not be able to run your aircraft engines or components beyond the manufacturer's Time Before Overhaul (TBO) limit without a CAA approved maintenance programme.

Licensing Requirements

Rule 61.155 *Privileges and limitations* allows a Private Pilot Licence holder to act, but not for remuneration, as pilot-in-command of an aircraft that is not operated for hire or reward, and to carry passengers in that aircraft.

Rule 61.205 *Privileges and limitations* allows a Commercial Pilot Licence holder to act as pilot-in-command of an aircraft operated for hire or reward.

However, if the CPL is pilot-in-command of a flight that is operating for hire or reward and carrying passengers or goods, then that operation must be carried out under a Part 119 certificate, as it is an air operation. See rule 119.5 *Requirement for certificate.* ■

Aircraft Certification Changes

Six sub-categories of the Special Category airworthiness certificate are now available, following rule changes that became effective in December 2009. Until then, Special Category – Experimental was used for a very broad range of aircraft and purposes.

Most aircraft certificated as Special Category – Experimental will now need to transition to one of the new categories by 3 December 2010. This will affect over 300 aircraft.

The owners of many aircraft in the restricted category will also want to transition them to one of the new categories. For example, a classic warbird owner may wish to place their aircraft in the Exhibition category, or the Limited category.

The six sub-categories for Special Category airworthiness certificates are: Experimental, Exhibition, Amateur-built, Primary, Light Sport Aircraft (LSA), and Limited.

The first step to transition your aircraft from one category to another, is to download and complete CAA form 24021/06 *Application for a Special Category Airworthiness Certificate*. This form is also used for new aircraft, or newly imported aircraft, that will be certificated under Special Category.

As we prepare *Vector*, two LSA aircraft and one Amateur-built aircraft have been certificated under the new system.

Experimental

Under the new categories, Experimental will mean what it says – basically, it will be used for aircraft undergoing test flying, flight evaluation, research, etc. Once a test flight requirement is satisfied, the aircraft will have a new airworthiness certificate issued in one of the other five categories, if it is a Special Category aircraft.

Exhibition

The Exhibition category is for aircraft used mostly for airshows, aerobatic competitions, or the film industry. These aircraft may be factory-built but will not be type-certificated. Single-seat warbirds, replica aircraft, and one-off unlimited aerobatic designs will be eligible for this category.

Amateur-built

This category is for aircraft that have been built by their owners for their own education and recreation. Most people affected by this change will be existing owners of amateur-built aircraft.

New amateur-built aircraft will complete a flight evaluation process under "Experimental" and then have a new airworthiness certificate issued in this category. If, however, the aircraft is modified at a later date, it may be required to go back into the Experimental category for further flight evaluation until the modification has been proven.

Primary

This certification standard originates in the United States – the category allows for future imports.

Light Sport Aircraft (LSA)

This category has gained international acceptance, and has standards agreed by participating countries. You may own an aircraft that is accepted as an LSA in another country, but was issued with a Special Category – Experimental airworthiness certificate, because that was all that was available.

Some one-off unlimited aerobatic aircraft will be eligible for the Exhibition category.

To transition to the LSA category, in addition to filling in the 24021/06 form, you must supply a certificate of conformity signed by the manufacturer. This states that the aircraft was manufactured to what is known as the international consensus standard (or you may see reference to F37 under ASTM International in your documentation).

If any modification or repair has been carried out since the manufacturer's certificate was issued, those changes must be approved in writing by the manufacturer.

The New Zealand LSA applies only to factory manufactured aircraft (S-LSA). Kit-built versions (E-LSA) will be certificated in the amateur-built category.

New aircraft in this category are now being imported.

Limited

Aircraft eligible for the Limited sub-category will be ex-military and vintage aircraft produced in a series and factory-built in a controlled environment, but not type-certificated. They will normally be multi-seat aircraft used for private operations.

As passengers may be carried, the rule seeks to mitigate risk by limiting the number of passengers in both aeroplanes and helicopters, issuing operations specifications to the operator, and ensuring that maintenance is controlled by a named principal maintenance provider. Provision is made in the rule for Limited category aircraft to be eligible for hire or reward operations.

Operating Limitations and Maintenance

An associated amendment to Part 91, in particular rule 91.105, prescribes the activities that can, and more importantly that cannot, be performed with the various types of Special Category aircraft. Some of these aircraft will be able to be used for flight training, but not for the carriage of fare paying passengers

The first Light Sport Aircraft (LSA) Special Category airworthiness certificate was issued to this Jabiru J120-C. Photo courtesy of Euro Flight International (NZ).

(Part 115 *Adventure Aviation* will address that issue).

Exhibition and Limited category aircraft must be operated in accordance with an operator statement that is issued under Part 47 and is associated with the certificate of registration for the aircraft. Also, as is currently required, a Special Category aircraft must be maintained in accordance with a maintenance programme approved under rule 91.607. There are some additional maintenance requirements in 91.607(d) for Exhibition and Limited category aircraft.

Also, under 91.607(f) a maintenance programme approved under 91.607 for a Special Category aircraft is only valid for the period that the certificate of registration for the aircraft remains valid. Any change of "ownership" means that the new "owner" must apply to the Director for the approval of a new maintenance programme for the aircraft, and also for a new operator statement under Part 47, if the aircraft is certificated in the Exhibition or Limited categories.

Special Category aircraft that are not used for hire or reward should have a review of airworthiness completed in the first year that the airworthiness certificate is issued after construction (rule 91.615(2)), but can then go to a biennial review (91.615(1)(ii)). If your Special Category aircraft has passed the first year requirement, it can go to the biennial review.

The new rules in 91.105(e) place significant restrictions on the use of Special Category – Experimental aircraft. As all the existing Special Category aircraft are currently certificated as Special Category – Experimental, except those with a special flight permit, there is a transition provision in rule 91.105(k) to allow the continued current use of existing Special Category aircraft until 3 December 2010.

There is an amendment to Part 43 that includes a new Subpart F which prescribes some additional procedures for the maintenance of Special Category aircraft.

What's Next?

These rule changes pave the way for some aircraft without Type Certificates to carry out hire or reward activities under the proposed Part 115 *Adventure Aviation*.

More Info

We've created a web page to keep you informed on the Part 21 transition process. See the CAA web site, www.caa.govt.nz, "Aircraft – Part 21 Changes – Aircraft Certification". If you want to keep informed about developments relating to Part 115, subscribe to our free email notification service – the link is on the home page. ■

Performance-Based Navigation

The drive towards greater efficiency and responsible environmental management is gaining momentum in every sphere of our lives. Performance-Based Navigation (PBN) is aviation's way of contributing towards these global goals. PBN will reduce fuel burn, airport and airspace congestion, and aircraft emissions.

The days of flying fixed tracks from one ground-based navigation aid to another are numbered. PBN will move the aviation industry away from traditional ground-based navigation systems, to greater dependence on satellite-based airborne navigation technology.

More precise point-to-point navigation will make it easier for Air Traffic Control to predict when flights will cross significant points, and when they will arrive at their destination. This will allow ATC to manage traffic flows in a more strategic manner, meaning fewer routing changes due to ATC requirements. Pilots will also be able to select with certainty a top of descent point for a flight idle, continuous descent approach, until established on finals.

This will result in reduced fuel burns. More direct routing will reduce sector flight times, as well as increasing schedule reliability, improving 'on time' performance, allowing greater fleet utilisation over an operational day, and reducing environmental emissions.

More precise navigation will also have a significant safety benefit. Standard Instrument Departures, Standard Instrument Arrivals, and approach procedures, will be designated as either Area Navigation (RNAV) or Required Navigation Performance (RNP). Both are extremely accurate forms of navigation. The fundamental difference is that the equipment on board an aircraft flying an RNP procedure must be able to automatically detect navigation errors and alert the crew. Aircraft flying an RNAV procedure do not need this automated capability.

ATS surveillance systems such as radar, ADS-B, or multilateration, are designed to detect navigation errors and are an added safety net, in addition to pilots monitoring their own navigation performance.

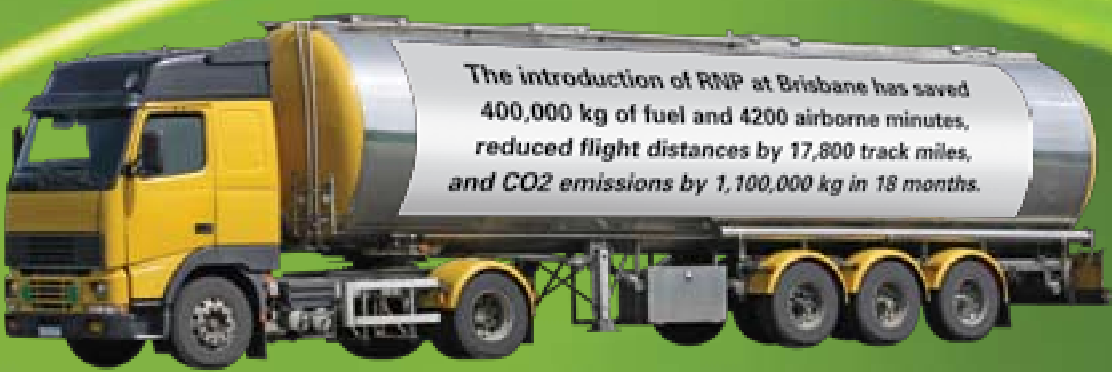
In 2007, the International Civil Aviation Organization (ICAO) passed a General Assembly resolution calling on States to complete an implementation plan for PBN by the end of 2009.

The CAA's new Airspace and Environment Policy Unit is responsible for preparing New Zealand's PBN implementation plan. The Plan outlines three major phases for the implementation of PBN in New Zealand, with target dates of 2012, 2017, and 2020.

The New Zealand PBN implementation plan was lodged with ICAO on 18 December 2009. The process will require Civil Aviation Rules to be amended to allow the use of GNSS as a sole, or primary, means of navigation. The next phase is the actual implementation, and a work plan is under development with identified working groups, including technical representatives, to address issues to ensure the PBN Implementation Plan is progressed.

For more information about PBN, visit the CAA web site, www.caa.govt.nz. You will find PBN under Quick Links on the home page, and you can subscribe to the PBN email notification service for updates.

The Airspace and Environment Policy Unit are also tasked with developing New Zealand's National Airspace and Air Navigation Plan, and integrating this plan with other Government strategies on transport, energy, and the environment. ■



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Wire Strike!

By Dean Lithgow

On Saturday, 7 November 2009, my day started at 5.30 am, flying my AS350.

It was just another perfect spray morning. But little did I know it was not going to stay that way for long! The job was spraying out hill country for cropping, so as you all know, boundaries need quite a lot of care with glyphosate.

While conducting the day's briefing, the farm manager showed me a set of power lines that ran through the block with another set of lines branching off these. A telephone cable ran through the block as well. He repeated, "You have got those wires, Deano?" I replied, "Yes, thanks."

I completed the first part of the block, and then I proceeded along an internal boundary on my second load, due to an awkward shape. Nearing the end of my run there was a loud bang, like a 308 gun going off. The machine shook but continued flying with a very slight vibration.

Yes, it was a wire and, no, the farm manager had not been aware of it. All the electric fence wires on the property run along the tops of the posts, this one took a short cut across a gut (small gully). The wire had struck the pitot tube and run up along the windscreen protector into the scissor section. It had then broken the wire at that point, as it is designed to do.

I know there was no one else to blame but myself. The irony was that the Wire Strike Protection Kit (WSPK) that was fitted to my machine had actually sat on the bench in the company hangar for three years before being fitted. Since then, the helicopter has done around 800 hours. The fitting of the kit saved my life and the helicopter too.

I know I am not the first pilot and unfortunately, I won't be the last, to have a wire strike. But had the kit still been on the hangar bench, I would probably not be here writing this article and there may be some red faces around.

We pilots are all taught thoroughly about wires when we are training and I am no exception. I think I do thorough briefings but the scary part of the whole experience is that if I were to do the job again tomorrow morning I believe there is nothing that I would do differently in respect to my approach to identifying hazards on this job. Hazards were discussed with the farmer. He identified the ones he was aware of and again checked with me just before I commenced the job, to ensure that I had not forgotten the hazards he had identified.

Wires can appear in the strangest of places and you may not be told about them. So, if your helicopter does not have a WSPK, invest in one. You may not plan on flying through a wire, but it may save you, as it did me.

I believe I was trained by two of the best in the industry years ago. Both drummed the danger of wires into me, both in basic training through to commercial, then during my Ag training.

I am not proud of hitting a wire but I am grateful my company installed the wire strike kit.

To my knowledge this is the first wire strike of a Squirrel helicopter in New Zealand with a kit on it. Usually, the outcome is a lot more severe.

I hope this spiel has not bored you but enlightened some. If a life or an aircraft can be saved through speaking out, it must be beneficial. ■

Dean points to where the wire struck the helicopter.

Photos courtesy of Dean Lithgow

Don't Be Left **Powerless**

The loss of one generator or alternator in flight is an urgency condition requiring careful management of your electrical load. A complete electrical failure is a race against the clock, as the exact life of your battery is dependent on many factors.

In a twin-engine aircraft, the single biggest drain on power is operating the landing gear. 30 to 40 percent of the total load capacity of both alternators (or generators) is taken up by raising or lowering the gear. Next biggest, is the cumulative drain from ice protection systems. Having pitot heat, stall vein heat, prop heat, windscreen heat, and fuel anti-ice turned on, plus activating de-icing boots, can use 25 to 35 percent of what is available. Lights (both external and internal) use up to 25 percent, with the landing light alone using 15 percent. Avionics equipment (navigation, communications, and display screens) can use between 10 and 15 percent, depending on the technology in use. Of these, transponders and communications transmitters are the heaviest users. Flaps use 5 to 10 percent, and environmental controls, such as air-conditioning, use 5 percent.

Even with both alternators or generators working perfectly, the electrical system in most light twins will not have a lot of spare capacity if you have everything switched on at the same time and then extend the gear. It therefore stands to reason that if you lose one, you may need to conserve electrical load immediately.

Conserve the battery by minimising radio transmissions and equipment use. The Flight Manual will usually provide guidance on load shedding and managing the electrical system if the generation system fails. Make sure you are familiar with this section.

One Down

If you lose one alternator or generator, follow the Flight Manual procedures to attempt to reset it. If you are unable to, look carefully at your electrical load, and turn off anything non-essential, to minimise stress on the generation system.

Is your remaining alternator or generator coping? If it appears to be coping with the load, monitor it carefully, but be aware that it may no longer cope if you have to descend through cloud and need to turn on ice protection, or when you need to extend the gear. The key is to anticipate when you will require more capacity, and adjust your load accordingly. If one alternator or generator is not coping, or it is only just coping, start load shedding.

Climb or descend out of icing conditions so you can turn all ice protection systems off. By day, turn off all lights, and at night, minimise your use of lights as much as possible. Use a torch

Photo: ©istockphoto.com/Scot Spencer

instead of cabin lights if necessary, and delay turning on your landing light until you are on the approach. Turn off the air-conditioning and any unnecessary LCD screens and avionic equipment. Follow the procedures in your Flight Manual and divert to land as soon as possible.

The worst case scenario would be if you were unable to escape from icing conditions. If you have to keep your ice protection systems on, you will be using close to the maximum load available from one alternator or generator. So when you select gear and/or flap, the power required to run that mechanism will be drawn from the battery. Since you are near the end of the flight, drawing from the battery is perfectly reasonable.

If it is critical to lighten the load, consider turning off the ice protection, and if still in below zero conditions after the gear and flap is lowered, you could turn it back on.

Battery Only

If you end up running on the battery only, this is an emergency situation requiring an immediate mayday.

Design requirements for IFR aircraft specify that the battery must last for at least 30 minutes, but the charge state, temperature, and general condition of the battery have significant influence over the actual battery capacity. Having non-essential loads on (such as ice protection systems) could reduce this time to 10 to 15 minutes.

It is important to have a rough idea of how long your battery will last, but it is impossible to know for sure how long you have to get the aircraft on the ground.

The PA-31 Navajo Flight Manual states:

"If load shedding procedures have been carried out, the battery will provide electric power for approximately 35 minutes to complete a landing under IFR conditions, including only a single flap extension and use of landing lights for a limited time.

"The time above depends upon the condition of the battery, temperature, and the time elapsed between alternator failure and load shedding."

Conserve the battery by minimising radio transmissions and equipment use. The Flight Manual will usually provide guidance on load shedding and managing the electrical system if the generation system fails. Make sure you are familiar with this section.

Single-Engine Aircraft

Electrical problems in a single-engine aircraft are usually more time-critical, so consider a diversion to land as soon as possible when any electrical issue develops.

Monitoring the ammeter and low voltage annunciator (if fitted) will enable you to detect electrical malfunctions. Problems are not always related to an insufficient rate of charge. Also watch for an excessive rate of charge, as this can result in the battery overheating if the alternator is not turned off.

Follow the Fight Manual procedures to attempt to reset your alternator or generator. If your annunciator illuminates again it is essential to minimise the current drain on the battery and divert to land as soon as possible.

Climb or descend to avoid icing conditions, so you can switch off any ice protection equipment fitted to your aircraft. Make sure your landing, taxi, and strobe lights are off. Turn off COM 2, NAV 2, and your autopilot if so equipped. If you are in VMC, consider turning off your GPS.

To minimise the number of radio calls you make, you may be able to use your cellphone to contact Air Traffic Control, or consider diverting to an unattended aerodrome if joining there would require less radio calls. ■

Photo: ©istockphoto.com/Prebranac

Threat and Error Management

There's a new international buzzword that will affect all pilots. If you haven't yet heard of it, you will definitely need to, but the good news is that you're probably doing some of it already.

What is TEM?

Threat and Error Management (TEM) is a concept that has evolved gradually from the constant drive to improve safety in aviation operations. For the pilots out there, TEM is similar to many concepts you already know, understand, and practise, such as Personal Minimums, Human Factors, CRM, and Health and Safety.

TEM focuses on threats, errors and undesired aircraft states (UASs). It is a way of pinpointing the mistakes you may make (errors) and identifying the hazards you encounter (threats) on your flight, and seeking a proactive way to limit them so that they do not lead to a UAS.

TEM's principles are not new to aviation. It is the formalisation of what could be called common sense. In all probability, Orville and Wilbur Wright practised some form of TEM when they made their first controlled flight with the Wright Flyer in 1903.

TEM accepts that threats and errors are everyday events that flight crews must manage to maintain safe flight. Therefore, flight crews that successfully manage these events increase their potential for maintaining adequate safety margins, according to Captain John Martin, Head of Safety Programmes, Air Nelson.

"For example, many pilots who spend a significant amount of time operating in Wellington airport have experienced its notorious north-westerly wind. But with time, this becomes a common aspect of their operations. The danger here is that it is often easy to normalise these conditions and fail to appreciate the threat it poses. Without mitigating strategies to accommodate the inevitable turbulence, wind gusts, windshear, and potential crosswind, the likelihood of a safe approach and landing is increasingly diminished," says John.

Although TEM sounds similar to risk management (RM), it is different. RM is the process of deciding whether or not operations can be conducted at an acceptable level of risk (go or no go), whereas TEM is the concept applied to managing and maintaining the safety of a particular flight.

What's in TEM?

TEM basically addresses the three issues of threats, errors, and UASs.

Threats – A threat or hazard is any situation, event, or circumstance that may affect the safety of flight. Threats are not errors, but they increase the potential for error. Some threats can be anticipated, others can be unexpected, and yet others can be latent. The threats that pilots face can come from many different sources such as weather, ATC, airports, terrain, aircraft, cabin, maintenance, documentation, etc.

Errors – Errors are usually the result of past activities. They are the consequences of an action or inaction, and reduce the margin of safety, and increase the probability of accidents or undesirable events. It is human nature to make errors, so error management is a vital safety device. Errors are normally classified as one of three types: aircraft handling errors, procedural errors, or communication errors.

UASs – UASs that result from ineffective threat and/or error management may lead to compromised situations. This is often the last stage before an accident or incident. The TEM model groups UASs into three basic categories: aircraft handling, ground navigation, and incorrect aircraft configurations.

TEM in Licence Syllabuses

The International Civil Aviation Organization (ICAO) has recognised the importance of TEM training and has recommended it for all pilot licences. The European Aviation Safety Agency plans to include TEM competence as a requirement for all flight instructors.

Ben Cook, Manager Human Factors, Civil Aviation Safety Authority (CASA), says that Australian applicants for PPL, CPL and ATPL licences have been required to be assessed in TEM since 1 July 2009.

"So far, the feedback from a number of flying schools has been very positive, as the development and integration of single-pilot human factors and TEM competencies provides the opportunity to formalise what many experienced instructors already know is best practice," says Ben.

"The new competency standards ensure students and new flying instructors have clearer guidance to understand the practical application of these skills, and how to best develop them to improve TEM, flight standards and aviation safety." Ben acknowledges the work of the late Phil Astley (Flight Standards Officer) who was instrumental in setting up the new competency standards for CASA.

In New Zealand, the CAA is to introduce TEM for all licence types (RPL, PPL, CPL and ATPL) and ratings within the current

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rewrite of Part 61 that is expected to be completed sometime this year.

CAA Manager, Personnel Licensing, John McKinlay, says, "The CAA is working on introducing TEM into the PPL and CPL syllabuses as international best practice supports the ICAO requirement for this type of training (TEM) to be incorporated from day one."

TEM will appear in the Flight Test Standards Guides as a skill to be assessed.

"In the flight test for a PPL licence, demonstrating TEM is likely to take a form that is similar to defensive driving for motorists," says CAA Flight Testing Officer John Parker, who is currently working on incorporating TEM into the licence syllabus.

"The pilot taking the PPL test would be asked to verbalise the decision-making process. They would be asked to identify any hazards they might encounter on their flight (eg, adverse weather), pinpoint (trap) and rectify errors (eg, incorrect heading bugged) and what steps to take to minimise the effect of the error, so that they don't lead to a UAS (in this case, off heading)," explains John. ■

Acknowledgements and further information:

- *GASCo Flight Safety*, Threat and Error Management, p5, Vol 45 No. 3. More information at www.gasco.org.uk.
- http://www.skybrary.aero/index.php/Threat_and_Error_Management (TEM).
- Material from Air Nelson and The LOSA Collaborative.

TEM in Action

Threat and error management is fast becoming a core element of the operating philosophy at Air Nelson.

"TEM is a progressive, well-proven, and well-researched international concept and has many safety benefits to it," says Captain John Martin, Head of Safety Programmes at Air Nelson.

"Air Nelson's pilots are being educated on the need to look through different eyes. This includes assessing what may have once been considered a 'normal' set of operational circumstances, to identifying the threats contained within, establishing management strategies, and monitoring the effectiveness of those interventions."

There have been enhancements to Air Nelson's Operational Competency Assessment (OCA) programme. Previously, despite operating in a two-pilot environment, only one pilot at a time used to be scrutinised as part of the OCA programme. That pilot was examined on his ability to manage the aircraft in all respects, including the need to identify any threats, trap their own errors, and to manage those events, albeit on a largely sole means basis.

"However, modern thinking acknowledges that as human beings we all make mistakes (errors). It is simply the way we function. There is little to be gained, therefore, if the impetus for trapping errors is placed on a single individual. The OCA now emphasises the crew (team) concept for identifying threats, trapping errors, and preventing undesired aircraft states," says John.

Line operations, pilot training, Crew Resource Management, Line Oriented Flight Training, and OCAs squarely focus on the concepts of TEM. Additionally, all pilot documentation is being updated.

"Previously, items worthy of note were contained within the paragraphs of an airfield description. Now, they are specifically highlighted as threats and described as such in approach and departure briefings."

This discussion on threats is emphasised at the end of the briefing. "The reasoning behind this is that the principles of human recall suggest that we remember best what we hear first and what we hear last. Hence, the repetition of the threats at the end of the briefing," says John.

He sums it all up by saying, "TEM promises to be a mainstay in our operations. Crews that develop contingency management plans, such as proactively discussing strategies for anticipated threats, tend to have fewer mismanaged threats; crews that exhibit good monitoring and cross-checking usually commit fewer errors and have fewer mismanaged errors; and finally, crews that exhibit strong leadership, enquiry, and workload management, typically tend to have fewer mismanaged errors and undesired aircraft states than other crews."

Photo: Above Ground Level

Mountain Flying

You are never far away from a mountain, or from being affected by one, in New Zealand – they're unavoidable. Many pilots avoid flying in the mountains, while some underestimate the dangers and give themselves a scare.

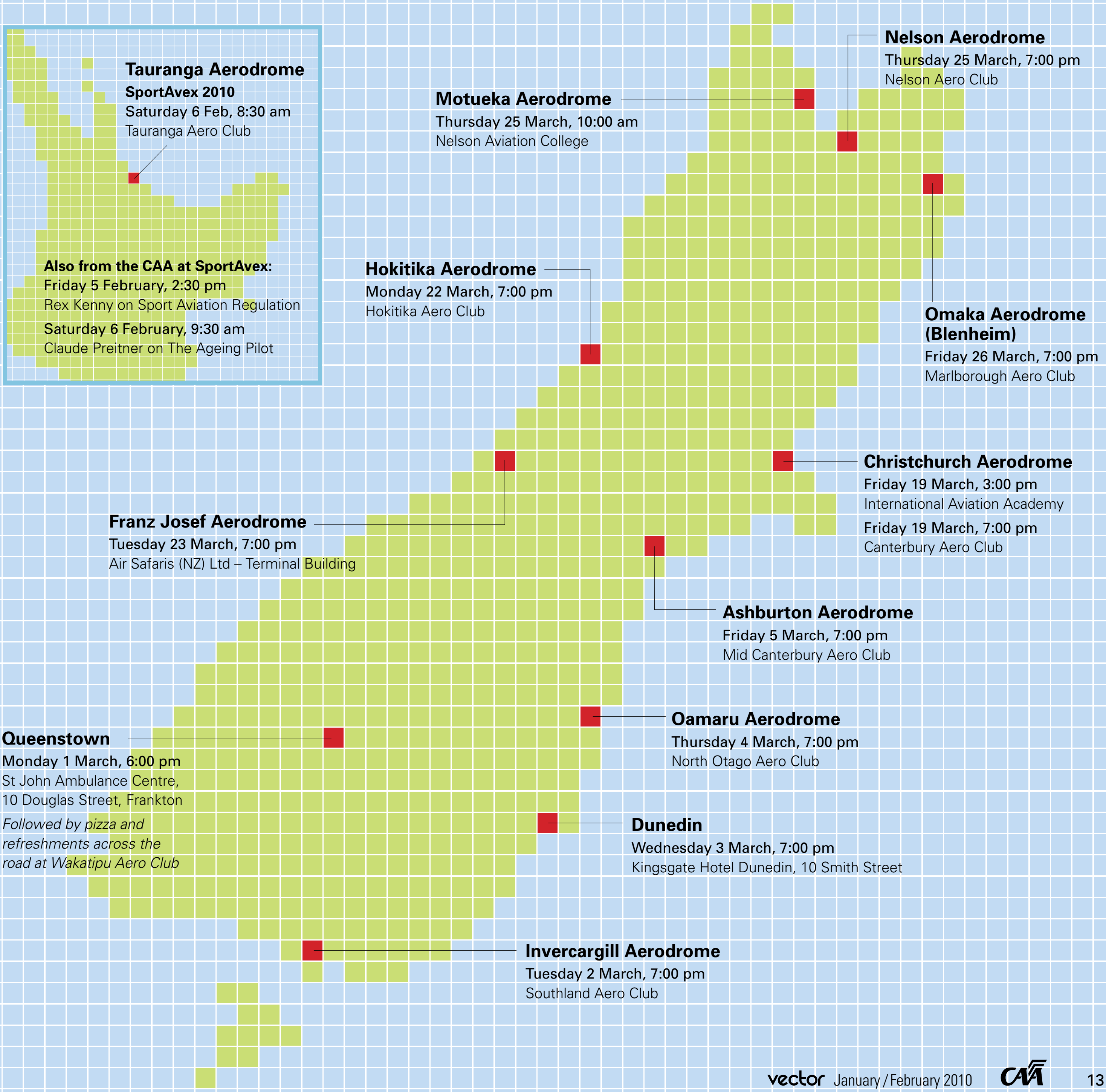
You need a complete set of skills (ideally specialised training) to fly safely in the mountains, and once you learn those skills, you and your passengers will have the opportunity to enjoy those flights. Those skills will also help you out when operating low level, or any time you can't see a clearly defined horizon.

Because of New Zealand's challenging terrain, mountain flying will be part of the pilot syllabus from 2011.

This year's AvKiwi Safety Seminars will give you a head start, along with some tips to help you fly safely and comfortably in the mountains. When you attend you will receive a brand new CAA-produced DVD on mountain flying, completely free and before general release.

This year our presenters are Jim Rankin, RNZAF Instructor, and Carlton Campbell, CAA Training Standards Development Officer – both have spent years flying in the mountainous terrain of New Zealand.

Here are the venues and dates for the first set of seminars. More venues and dates will be published in the March/April *Vector*, and a complete list of seminars will be on the CAA web site, www.caa.govt.nz, see "Seminars and Courses" – so keep an eye out. ■



Woodbourne Control Zone Changes

A new Omaka VFR Transit Lane is up and running, so here are some important considerations for IFR traffic approaching and departing Woodbourne, and for VFR traffic at Omaka.

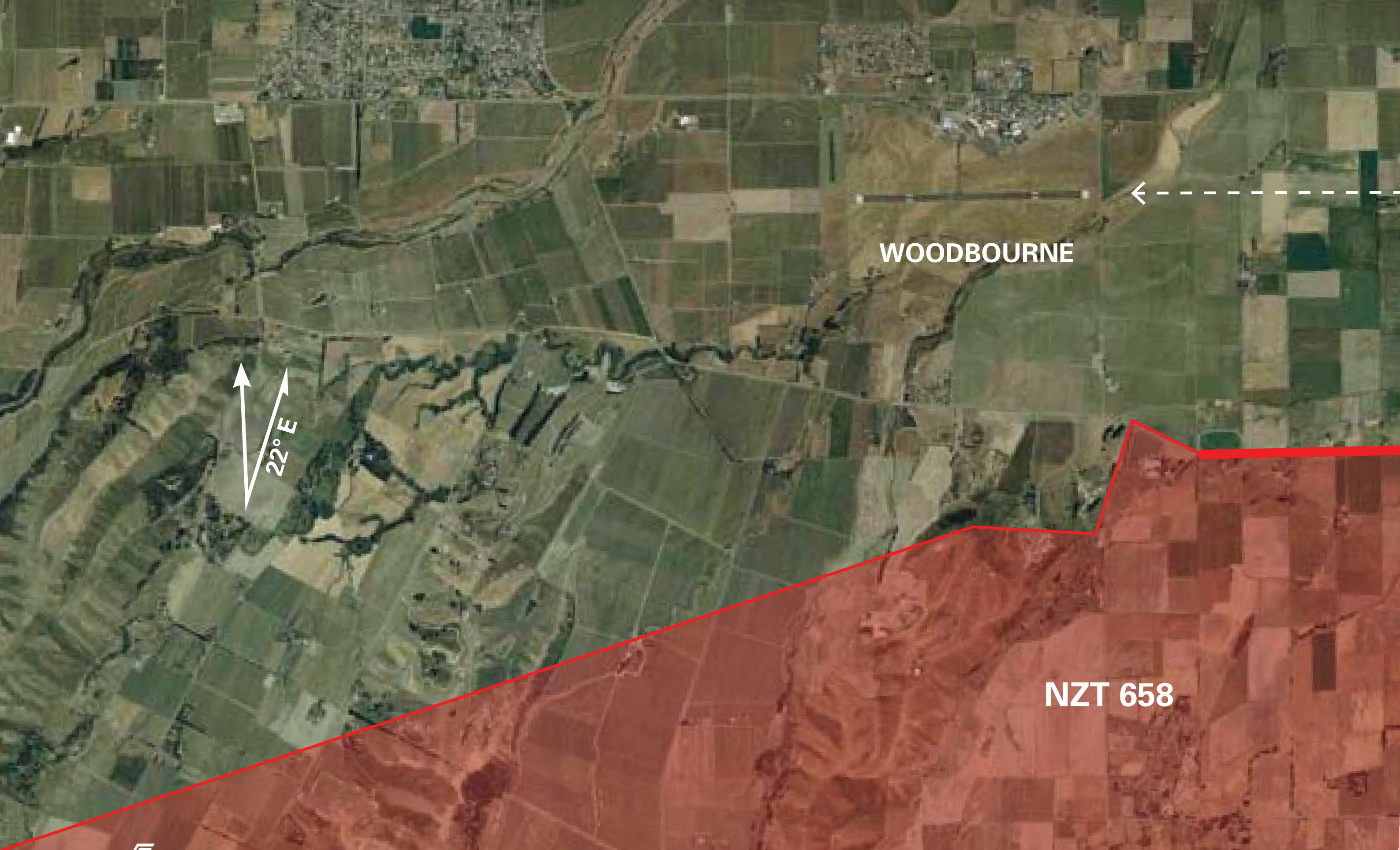
On 19 November 2009, the Woodbourne Control Zone changed. It is now smaller, no longer extending as far to the south-east, and the Maxwell, Taylor, and Fairhall Sectors have gone – with the airspace below 1500 feet largely replaced by the Omaka VFR Transit Lane (NZT 658). The Transit Lane stretches from The Diversion VRP at the north-eastern corner of the CTR, south through the instrument sector, to the south-eastern corner of the zone, and then west, encompassing Omaka Aerodrome and continuing to the south-western corner of the zone. VFR traffic can operate within NZT 658 from the surface to 1500 feet, by day, without a clearance from Woodbourne Tower.

What Does this Mean for IFR Operations?

The boundary of NZT 658 allows VFR traffic to operate only 0.9 NM south of the final approach track for Runway 24, and the departure track for Runway 06, at Woodbourne.

Woodbourne Tower are no longer required to give IFR aircraft traffic information about aircraft operating VFR at Omaka. Although NZT 658 is not transponder mandatory, aircraft equipped with transponders should be operating them on mode A and C so ACAS-equipped aircraft can identify potential traffic conflicts. It is also possible for NORDO aircraft to operate within NZT 658, so a good listening watch, while essential, will not give you a complete picture. Both these sources of information should be backed up with effective visual scanning. Although Woodbourne Tower are not responsible for providing traffic information, they will continue to monitor aircraft operating near the controlled airspace boundary.

IFR aircraft flying the VOR/DME approach to Runway 24 can descend to 1300 feet when tracking 242 degrees inbound to the aerodrome between LUTKA, and 5 DME WB. Those on the RNAV (GNSS) RWY 24 approach can descend even lower, to 1200 feet.



Aircraft may descend to the 1200-foot or 1300-foot hard height if they are attempting to get visual in order to break off the approach, and proceed VFR to another aerodrome.

While between LUTKA and 5 DME aircraft will pass through T658, where VFR aircraft could be operating up to 1500 feet, without transponders and without making radio calls. If you fly the advisory altitudes, however, these will provide at least 1000 feet of separation from any traffic in NZT 658 and keep you out of the 'no man's land' where you have no protection.

When carrying out a visual approach from the south it is safest to stay above 1500 feet until clear of NZT 658, or alternatively track to LUTKA (15 DME to the east of the aerodrome) and begin a visual approach from there.

On a left hand visual departure from Runway 24, if you start to turn as soon as you reach 500 feet (depending on your aircraft type), you may cross into NZT 658 before you have climbed through 1500 feet. Consider tracking the extended centerline for longer to avoid this. Similarly, if you are on a right hand visual departure from Runway 06, ensure you are above 1500 feet before crossing New Renwick Road and potentially entering T658.

VFR Operations To and From Omaka

Marlborough Aero Club CFI, Kevin Wilkey, says that after a few weeks of using the new transit lane, "Things are going really well so far and the locals are enjoying having less restrictions placed on them by Woodbourne Tower."

Kevin emphasises that, "Accurate position reporting is even more important now that Woodbourne Tower are not required to pass on traffic information."

Pilots of transponder-equipped aircraft should ensure they are operating on Mode A and C at all times.

The circuit direction for Runways 01, 07, and 12 at Omaka changed to right hand on 19 November 2009, so that all circuits turn to the south – away from the NZT 658 boundary.

It is essential for VFR pilots to know where New Renwick Road is, so they do not stray into the Woodbourne IFR approach and departure sector.

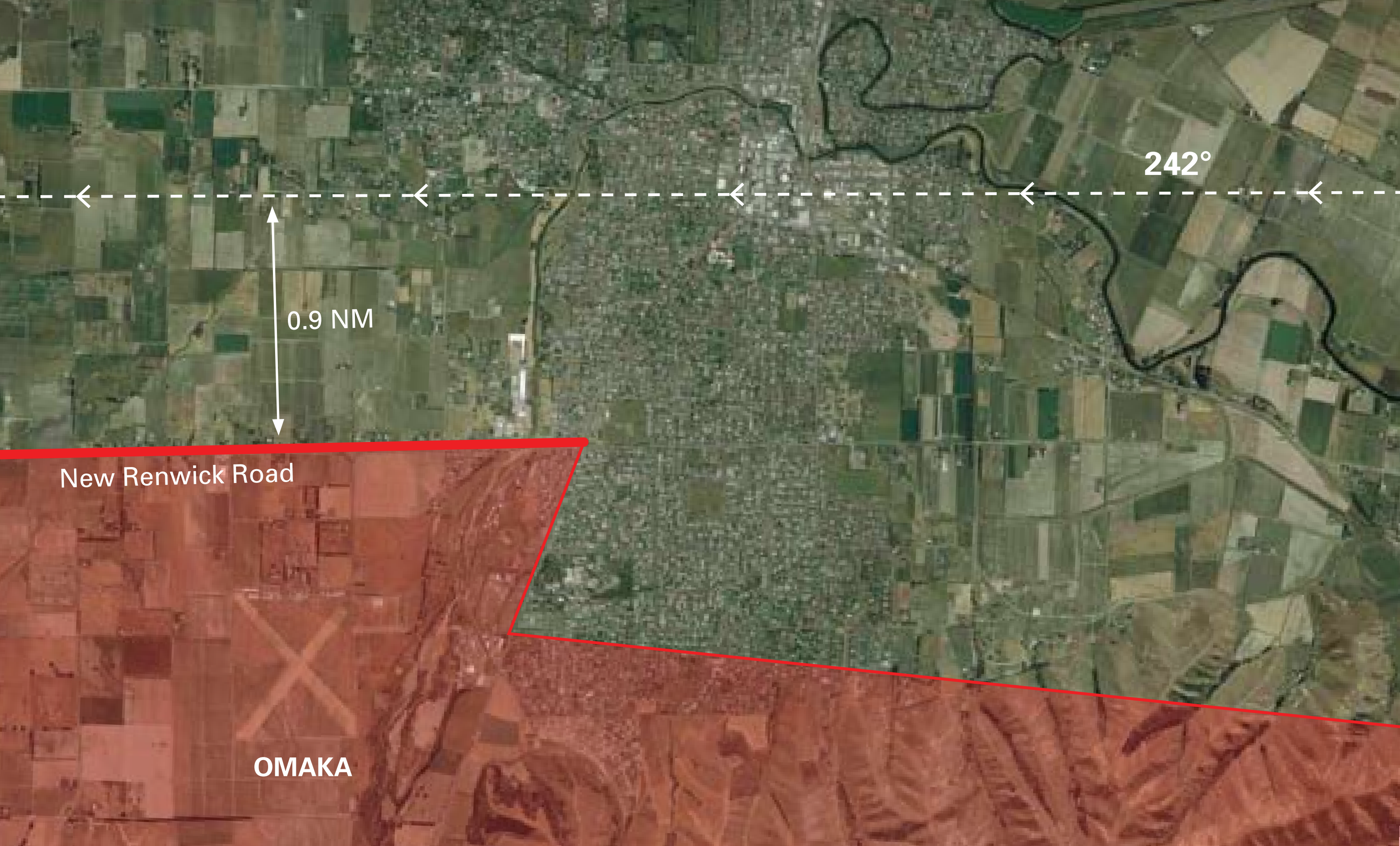
Also, pilots using Runway 01 cannot fly a standard circuit pattern. It is not possible to fly a square crosswind leg within T658. To avoid busting controlled airspace, a low level turn is required after takeoff, and a crosswind leg that converges towards the downwind is necessary.

When joining for Omaka, make sure you stay within the boundaries of NZT 658. If you wish to fly above 1500 feet for terrain clearance, to avoid turbulence, or due to traffic congestion (a typical bottleneck being between Watertank VRP and Vernon Works VRP), then you must contact Woodbourne Tower for a clearance. Similarly, if you wish to track more directly to Omaka through the CTR/D, you must contact Woodbourne Tower.

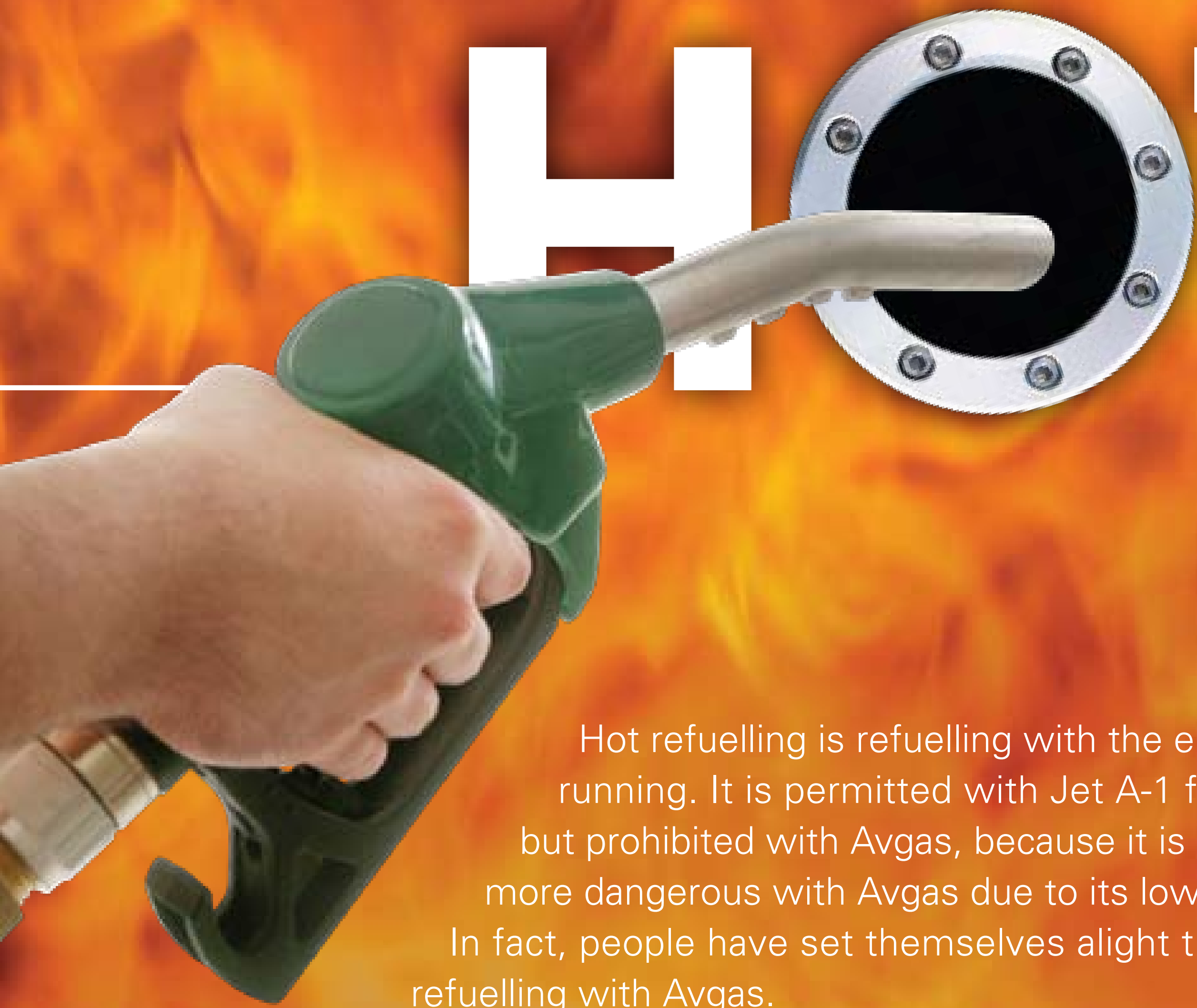
The 'Ponds' VFR arrival and departure procedures for Omaka published in *AIP New Zealand* have been cancelled by NOTAM. A new procedures page will become effective 11 February 2010.

The new Omaka VFR Transit Lane will be subject to review. VFR pilots must be diligent at remaining within the boundaries of the transit lane, and only enter the CTR/D when cleared to do so. If a high level of compliance is not achieved, and traffic conflicts with IFR aircraft occur, then the transit lane may be disestablished and area surrounding Omaka returned to controlled airspace in future.

For more information about weather conditions in the Woodbourne and Omaka area refer to the September/October 2005 issue of *Vector*. ■



HOT



Hot refuelling is refuelling with the engine(s) running. It is permitted with Jet A-1 fuel, but prohibited with Avgas, because it is so much more dangerous with Avgas due to its low flashpoint. In fact, people have set themselves alight through refuelling with Avgas.

Photos: ©istockphoto.com/Hidesy/HerbertusT/Sbayram

"Hot refuelling with Avgas is fraught with danger and is extremely unsafe," says Simon Spencer-Bower, an 18,000-hour pilot and owner of Wanaka Helicopters.

"It's good to see that the rules now forbid this, which means that individuals who used to undertake this dangerous practice in the past, are not legally allowed to anymore."

The argument for hot refuelling is to reduce engine cycles on turbine engines and save maintenance costs. So it's about saving money, and sometimes time, but there are inherently more risks.

The main increased dangers of hot refuelling are:

» moving rotors or propellers;

» noise and rotor/prop blast can create confusion – people can do silly things in a perceived 'rush'; and

» increased chance of static electricity build-up.

Recommendations to mitigate these risks are:

» Only consider hot refuelling when allowed by the rules (ie, never with Avgas), and also when permitted in the Flight Manual (not all manufacturers allow hot refuelling).

» You should be familiar with the minimum requirements for refuelling in rule 91.15.

» Part 135 operators must have documented procedures in their expositions (rule 135.73).

» A fire extinguisher should be immediately available. Locate it several metres from the refuelling point.

» Only those essential to the refuelling operations should be near the aircraft.

» The fuel nozzle should always be attended while refuelling.

» No cigarettes or cellphones near the refuelling operation.

» Within the vicinity of the refuelling operation, no radio transmissions should be made, or electrical switches operated.

» Only refuel to about 95 percent to avoid overflows.

» Always be aware of the potential for static electricity build-up and check that bonding to earth is in place.

» For aeroplanes – engine at ground idle; for helicopters – collective at flat pitch.

Refuelling

> "Hot refuelling with Avgas is fraught with danger and is extremely unsafe."

- For aeroplanes, it should be possible to stop the engine and move the aircraft in the event of a fuel spillage.
- For helicopters, it is recommended that the pilot remains at the controls, to facilitate flying the helicopter clear, should there be a fuel spill.
- Do not refuel on elevated helipads when upward draughts of air may be present, as this can displace some fuel.

Static Hazards

There is increased risk of a static build-up on an aircraft with the engine(s) running. But remember that static can also build up on your clothing, or other items close to the refuelling operation, such as plastic funnels. Just one spark from a static build-up can ignite fuel vapour.

Andy Brown, of Coast to Coast Helicopters, points out that, "People need to realise that static electricity can be present when refuelling. We had this very clearly demonstrated to us recently at dusk, when we watched a colleague refuelling. He was wearing 100 percent nylon shorts, and although he was using an anti-static, anti-drip nozzle, we could still see static sparks from 25 metres away.

"We have a bigger than standard extinguisher on site. A 2.5 kg extinguisher always needs to be handy, but we now take an additional 4.5 kg extinguisher on every spray-support unit. It is important to remember that the fire extinguisher should be placed about four metres or so away from any refuelling activity, so that in case of a fire, the extinguisher is still easily accessible."

Some common static hazards:

Fuel Flow Rate: The need for fast refuelling of aircraft results in higher fuel transmission speeds, which means greater risk of static electricity build-up and also more fuel splashing.

Splashing of Fuel: If splashing or spraying occurs during the refuelling process (most likely during top-loading of a tank) a charged mist or foam can be produced.

Hot and Dry: Hot and dry conditions pose the greatest atmospheric risk of fuel flammability.

Dangers of Synthetic Clothing: Polar fleece, polyester, nylon and other synthetic materials are static hazards. Avoid wearing such clothing, but if you are, never remove it near a refuelling operation.

Chamois Leather: Studies have found that the use of a chamois as a filter can be a static hazard. Synthetic chamois are even more of a hazard.

Bonding

Static electricity will take the quickest path to earth (or ground). If this means leaping the air in the form of a spark, there is a great risk of igniting fuel vapour. This is mitigated by providing an electrical connection between earth, the fuel pump, and the aircraft – often referred to as bonding.

All bonding connections between ground equipment and the aircraft should be completed before tank filler caps are removed, and should be maintained until the filler caps have been replaced.

It is also advisable to keep the nozzle in contact with the side of the tank filler neck.

If you are refuelling from cans or drums, you must take some measures to reduce the risk of an electro-static discharge. Remember, the risk of a static electricity build-up is greater when hot refuelling.

The *Fuel Management* Good Aviation Practice booklet has information on fuelling procedures and precautions. Email: info@caa.govt.nz for a free copy. ■

Avoiding an Auto

A helicopter carrying out autorotational training can be hurtling towards the ground at up to 2000 feet per minute. Fixed-wing pilots operating nearby should know the limitations of a helicopter in an autorotation, and where to look for this traffic.

On 17 February 2008, a Cessna 152 and an R22 collided in mid-air over Paraparaumu, resulting in three deaths. At 11:11, the aeroplane pilot transmitted "Paraparaumu Traffic – Echo Tango Yankee overhead the field 1500 feet, commencing standard overhead rejoin 34 seal". The helicopter was early into its crosswind turn for the opposing grass 34 circuit. Thirty eight seconds later, the helicopter pilot transmitted, "Paraparaumu Traffic – Hotel Golf Victor is close in downwind grass 34, practice 180 autorotation to the centre grass 1000 feet".

The two aircraft collided at 90 degrees to each other at 1000 feet as the C152 was turning left to cross the upwind end of sealed runway 34, and the helicopter was midway along a close downwind leg for grass runway 34.

The Transport Accident Investigation Commission report into the accident states:

"The pilots in the helicopter should have understood what was meant by a standard overhead rejoin and the general flight path an aeroplane would have followed when flying the procedure to runway 34 seal. Equally the aeroplane pilot should have understood what was meant by an autorotation, as this was taught to local students early in their training. He should certainly have known where the helicopter was when the helicopter pilot transmitted that the helicopter was 'close in downwind grass 34, practice 180 autorotation to the centre grass 1000 feet'."

But how many fixed-wing pilots really know what an autorotation is, where a helicopter in an auto will be positioned (compared to a normal circuit), and what to do if they hear one being conducted?

What is an Autorotation?

An autorotation is essentially a forced landing for a helicopter. The engine normally turns the rotors. If the engine fails, the collective is lowered to reduce the angle of attack on the rotor blades, and begin a descent. The relative airflow coming up through the rotor disk can then keep the rotors turning. With the rotors still turning, it is possible to maintain control of the helicopter.

The descent rate during an auto is generally between 1000 and 2000 feet per minute. When approaching the ground, the pilot slows the descent to a manageable rate by using aft cyclic to flare. The flare must be timed so that the descent rate goes to zero just above the ground. The helicopter is then put into a level attitude and collective is used to cushion the touchdown.

A standard "straight-in" autorotation is carried out after the helicopter has been positioned on finals. Once a student is competent at this manoeuvre, they will be taught the 180 degree autorotation. This is commenced from a downwind position, turning through 180 degrees to land into wind.

What to Expect

Here are some important considerations for fixed-wing aircraft operating at an aerodrome where helicopter autorotation training is carried out.

On the Ground

If you are at a hold point waiting to cross a grass runway, or needing to taxi past any area used for helicopter autorotation training, a thorough lookout is essential.

Where to look:

» A helicopter doing a standard auto (straight-in) will be a lot higher on finals than one on a powered approach profile.

» A helicopter doing a 180 degree auto will start overhead the aerodrome, usually between 1500 and 1000 feet agl, and often in a very close downwind position. The aircraft roof could make it very hard to see traffic in this position.

If you hear a helicopter commencing an auto overhead from 1000 feet, it may look as though you have plenty of time to taxi across the runway or the area they are aiming for. But with descent rates of up to 2000 feet per minute, it will only take them around 30 seconds to touch down right where you may be considering taxiing. They will take considerably less time to get on the ground than a fixed-wing glide approach would.

In the Air

If you are about to join, and you hear a helicopter intending to carry out a 180 degree auto (particularly to a parallel runway with an opposing circuit direction), then it is not advisable to fly a standard overhead join, as there will be no non-traffic side. If there is no ATIS or AWIB to tell you the wind direction, circle overhead at least 500 to 1000 feet above the aerodrome circuit altitude, to determine the wind. If you have not positively identified the helicopter and its phase of flight, then vacate the area completely to descend to circuit height, before returning to join straight in or downwind for the appropriate runway.

There is a critical period of time while a helicopter pilot is transitioning to autorotation and a stable descent, when their ability to respond to a traffic conflict is compromised. For a trainee, the transition from the engine generating the required rotor rpm, to the relative airflow generating it, is a high work load time, requiring split-second timing and decision-making. During this brief period, a helicopter pilot's attention is focussed inside the cockpit.

A fixed-wing aircraft joining will normally be descending at around 600 feet per minute. If you compare this to the helicopter's descent rate of up to 2000 feet per minute, it becomes clear that a fixed-wing pilot's ability to react and avoid a conflict is much greater than a helicopter pilot's ability during this critical period.

Once established in an auto, however, helicopters can go around and be responsive to traffic conflicts.

Communication, a listening watch, an appreciation of the other aircraft's capabilities, and a thorough lookout, are essential for safe operations. The safest course of action is to give a helicopter performing an autorotation a very wide berth. ■

R22 ZK-HGV (left) and C152 ZK-ETY (right) collided in midair over Paraparaumu in 2008.

Flight Planning for Maximum Efficiency

The sun comes up on a lovely morning. There is a big high sitting slap-bang over the whole country. You decide you are going aviating. *Yey!*

Now that the weather is sorted, you need a plan. How are you going to get to your destination? What is the best route? What is the best altitude? And how can you minimise costs?

Remember this simple truth – altitude and tailwinds are your friend.

Check the ARFORs and the MetVUW 700 hPa winds (web site addresses are at the end of this article) and see what the wind is doing at altitude. Will it give you a tailwind going there or coming back? How high do you need to go to take advantage of that tailwind? Will the performance of your aircraft allow you to take advantage of it?

Increasing your altitude gives you two benefits in the cruise – increased TAS, and a reduced fuel burn. As altitude increases, true airspeed (TAS) increases for the same indicated airspeed (IAS). So if you are flying at a constant IAS, the higher you fly, the faster the TAS will be.

Cruising at any altitude above 1500 feet usually allows you to lean the mixture and gain much better fuel efficiency. Consult the Flight Manual and performance charts (sometimes printed on the sun visor) for details on how to do this.

Then you need to think about airspace, because flying at altitude means you will probably need to pass through controlled airspace, and you will require a controlled VFR clearance. Don't be put off. At a quiet time of day, when controller workload is low or the traffic situation is simple, getting a controlled VFR clearance is entirely possible. When they are busy, it's not so likely, but you can always ask.

It is a good idea to file a flight plan; it is inexpensive and gives you a designated transponder code. It is also a good time to check busy times with ATC, and perhaps amend your departure time to take account of that.

To request a controlled VFR service you need to contact ATC on the appropriate frequency when approaching the airspace boundary. All of the controlled airspace frequencies are printed on the VNCs, but make sure that you contact them in plenty of time, and you receive your clearance before you enter.

An example of the radio call you make is:

> ***"Christchurch Control, Alpha Bravo Charlie." Wait for the response.***
>
> ***"ABC, squawking 4321, Kaikoura 5500 feet, request Controlled VFR from present position to Cape Campbell, Ohau Point, Paraparaumu, 9500 feet."***

Write down and readback the clearance. Then do not deviate from the clearance without permission.

Descent Calculations

To work out a TOD point you need:

» **the altitude you want to lose** eg, 9500 feet (cruising altitude) – 1500 feet (for the join) = 8000 feet

» **your planned rate of descent** eg, 500 feet per minute

» **your groundspeed** eg, 180 knots

1	Calculate the minutes required	8000 ft at 500 fpm	= 16 min
2	Calculate the distance required	(16 min at 180 NM/hr)	
	a) Turn the minutes into a decimal of the hour	16 ÷ 60 = 0.2667 hr	
	b) Multiply the time by the groundspeed	$0.2667\text{ hr} \times \frac{180\text{ NM}}{\text{hr}}$	= 48 NM
	or 180 kt = 3 NM per minute	so $16\text{ min} \times \frac{3\text{ NM}}{\text{min}}$	= 48 NM

For the average light single-engine aeroplane the benefits of altitude can seem minimal when comparing performance at different levels. However, the longer the time spent at altitude and the increased wind speed experienced at altitude will contribute to the overall savings.

Advantages

There are many advantages to being in controlled airspace:

» The number of radio calls you make may be reduced.

» Depending on the class of airspace you are in, you will either be warned about conflicting traffic, or separated from it – but you still need to keep a good lookout.

» Someone is monitoring you, so if anything goes wrong you are in immediate contact with help. Even if there is no radar coverage at your current location you will still be in radio contact.

» Overall, your workload may be eased.

Considerations

Some important points to consider:

» You must have a transponder and know how to use it.

» You must keep a continuous listening watch on the ATC frequency while in controlled airspace.

» Unless you have filed a flight plan, as soon as you leave controlled airspace there will be no alerting service.

» You may be required to maintain a specific cruising altitude, while remaining VFR.

» You must have a plan that covers you if the control service is not available, or becomes unavailable. This includes always being aware of where you are by always having your finger on the map, knowing what terrain is underneath you, and where the controlled airspace starts and finishes.

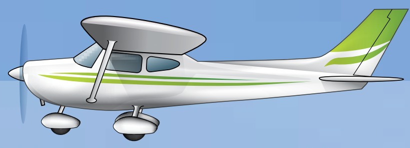
» You must remain VFR at all times. Think very carefully before going VFR on top – you must be able to descend while remaining VFR at any time, not just at your destination.

» Don't assume that there will be no turbulence at altitude. You will still need to keep an eye on the weather and the wind.

» If all goes to plan, and you can stay at your requested altitude the whole way, you will need to work out a top of descent (TOD) point (see left). If you have a GPS, it can help you work this out. There is no point arriving over your destination at 9500 feet, and then have to descend overhead, when you could have used the tailwind and the descent power setting to further minimise your fuel burn. ■

Helpful Web Sites

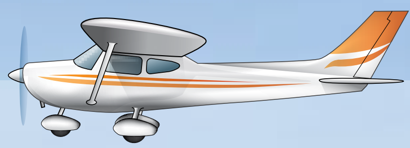
http://metflight.metra.co.nz
www.metvuw.com
www.ifis.airways.co.nz



9500 feet

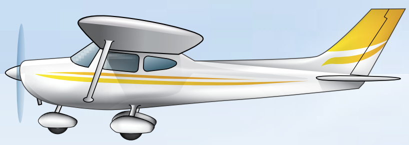
* Still air, TAS 112 kt, flight time 1:27, using 44.4 litres.

But with a tailwind of only 20 kts at 9500 feet, you save at least 10 minutes and 4.5 litres in the cruise alone making it quicker and cheaper to cruise at 9500 feet rather than 3000 feet.



6000 feet

* Still air, TAS 109 kt, flight time 1:26, using 42.6 litres.



3000 feet

* Still air, TAS 107 kt, flight time 1:26, using 40.9 litres.

* These performance figures are used for illustration only. We have used a constant %BHP (percentage brake horse power) setting, a standard temperature day, and a distance of 150 NM in still air. We have also assumed that the engine has been leaned in the cruise in accordance with the Flight Manual procedure. We have allowed time and fuel for the climb in our calculations in accordance with the Flight Manual figures.

Clearance **Shorthand**

Most people develop their own shorthand for writing down clearances. There is no regulatory requirement to use shorthand or to use an official version, but we thought the options here might be useful as a starting point for developing or perfecting your own.

Using shorthand to copy your clearances should, with practice, enable you to copy long clearances accurately. As always, if you are unsure, ask for clarification.

Words and phrases	Shorthand
Above	ABV
Above (altitude – hundreds of feet)	$\underline{70}$
Advise	ADV
After (passing)	<
Airway (designation)	V26
Airport	AP
Alternate instructions	( )
Altitude 6000 – 17,000	60–170
And	&
Approach	APP
Approach control	APC
At	@
(ATC) advises	CA
(ATC) clears or cleared	C
(ATC) requests	CR
Bearing	BR
Before (reaching passing)	>
Below	BLW
Below (altitude – hundreds of feet)	$\overline{70}$
Centre (eg, Runway 23C)	C
Cleared as filed	CAF
Cleared to land	L
Climb to (altitude – hundreds of feet)	↑170
Contact	CTC
Course	CRS
Cross	X
Cruise	→
Depart	DEP
Departure control	DPC
Descend to (altitude – hundreds of feet)	↓70
Direction (bound):	
Eastbound	EB
Westbound	WB
Northbound	NB
Southbound	SB
Inbound	IB
Outbound	OB

Words and phrases	Shorthand
Direct	DCT
DME fix (3DME)	D3
Each	EA
Enter control area	→△
Estimated time of arrival	ETA
Expect	EXP
Expect approach clearance	EAC
Expect further clearance	EFC
Final	F
Flight level	FL
Flight planned route	FPR
For further clearance	FFC
For further headings	FFH
From	FM
Heading	H
Hold (direction)	H( )
Holding pattern	⬭
ILS approach	ILS
Initial approach	/
Join or intercept airway/jet route/track or course	≥
Left hand	LH
Left turn after takeoff	↰
Maintain or Magnetic	M
Non-directional beacon approach	NDB
Out of (leave) control area	△→
Over (station)	O
On course	OC
Procedure turn	PTN
Radar vector	RV
Radial (080 radial)	080R
Remain well to left side	LS
Remain well to right side	RS
Report crossing	RX
Report departing	RD
Report leaving	RL
Report on course	R-OC

Photo: ©istockphoto.com/Blackred

How to Get Aviation Publications

AIP New Zealand

AIP New Zealand is available free on the internet, 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.

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).

Words and phrases	Shorthand
Report over	RO
Report passing	RP
Report reaching	RR
Report starting procedure turn	RS PTN
Reporting point	REP
Reverse course	RC
Right hand	RH
Right turn after takeoff	↗
Route designator	V4
Runway (number)	RWY18
Squawk	SQ
Standby	SBY
Straight-in approach	SI
Takeoff (direction)	T→N
Tower	TWR
Until	U
Until advised (by)	UA
Until further advised	UFA
Via	VIA
Visual approach	VA
VOR	⊙
VORTAC	Ⓣ
While in control area	△

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.

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*
22 Feb 2010	1 Mar 2010	6 May 2010
22 Mar 2010	29 Mar 2010	3 Jun 2010
19 Apr 2010	26 Apr 2010	1 Jul 2010

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

Murray Fowler
(South Island)
Tel: 0–3–349 8687 Fax: 0–3–349 5851
Mobile: 027–485 2098
Email: 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

Bob Jelley
(Maintenance, South Island)
Tel: 0–3–322 6388 Fax: 0–3–322 6379
Mobile: 027–285 2022
Email: jelleyb@caa.govt.nz

Aviation Safety & Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY
(0508 472 338)
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".

Photo courtesy of Jump Start

Canopy Safety and Handling

There was plenty of praise from participants for the Canopy Safety and Handling Course, held in October, at the Whenuapai RNZAF Aviation Sports Club, Parachute Section (known as ASC Para).

The camp was held to promote smarter canopy skills that would help participants be more confident while flying. ASC Para arranged for Australian, Robert McMillan, currently ranked No. 4 in the world in Canopy Piloting, to run the camp.

Participant Simon Lang is all praise for McMillan and the course, "I really enjoyed the opportunity to learn from Rob, who is both a skilled canopy pilot and a very good teacher. He was extremely generous in sharing his knowledge and experience. I came to the course with some butterflies in my gut and a new(ish) rig that I hadn't jumped yet. Rob's relaxed manner, disciplined and safety-focused tuition and tips helped settle the nerves, and I was able to fly my new canopy with growing skills and confidence."

Nick Pickering, another participant, says the main thing about the course was that, "It made us focus on, refresh, and improve our canopy skills. I would recommend it to jumpers at any level."

Experienced parachutist, Steve Shaw, says he found it especially useful to practice emergency procedures in a simulated, controlled environment, as part of the course.

Event organiser Tim Fastnedge, Operations Officer, ASC Para, is delighted at the response, "The sport has seen little focus on upskilling of individual sport parachutists for years. We're slowly trying to change this."

The course was sponsored by the CAA. Rex Kenny, Manager Sport and Recreation, says, "There is a lot of value in providing advanced training to recreational parachutists, and there is a distinct advantage in bringing an instructor with loads of experience over for the course, as instructors with so much experience are hard to locate in the New Zealand recreational sector – they are all in the commercial sector.

"Such courses mean that instead of hard landings, parachutists have some control over landings when they get more canopy handling skills. It removes a level of risk and results in less injuries," says Rex.

The course was also sponsored by Auckland Skydivers Incorporated, RNZAF Aviation Sports Club, and New Zealand Aerosports Limited.

This is the first such course run by ASC Para. Given the current economic climate, there was no registration fee charged for this camp, but Tim says future participants should expect to pay a fee, which could vary between $50 to $100 per participant. Participants also need to be members of the RNZAF ASC to participate – the annual membership costs $30 per year.

ASC Para hope to do at least one such camp annually from now on, focussing on different parachuting disciplines.

In New Zealand, the New Zealand Parachute Industry Association, New Zealand Skydiving Association, and PARANZ (trading as Preflight Services), hold a Part 149 Certificate. These organisations issue parachutist certificates and all parachutist certificate holders are required to operate to that organisation's standards. ■

For more information on future courses, contact Tim Fastnedge:
Tel: 027–570 1702
Email: info@skydiveclub.co.nz
Web: www.skydiveclub.co.nz.

Parachutist Certificate holders can get a free subscription to *Vector*, see the CAA web site, www.caa.govt.nz, Sport and Recreation page.

Accident Briefs

More Accident Briefs can be seen on the CAA web site, www.caa.govt.nz.
Some accidents are investigated by the Transport Accident Investigation Commission, www.taic.org.nz.

ZK-HDJ KHI Kawasaki-Hughes 369HS

Date and Time:	11-Dec-06 at 17:15
Location:	Mount Ruapehu
POB:	5
Injuries (Serious):	3
Injuries (Minor):	2
Damage:	Destroyed
Nature of flight:	Other Aerial Work
Pilot Licence:	CPL (Helicopter)
Age:	33 yrs
Flying Hours (Total):	2735
Flying Hours (on Type):	625
Last 90 Days:	94

On 11 December 2006, a Kawasaki-Hughes 369HS helicopter, registered ZK-HDJ, took off with the pilot and 4 passengers on board from near Crater Lake on Mount Ruapehu, at an elevation of about 8300 feet. The pilot could not climb the helicopter above the surrounding terrain, so he descended towards the lake to accelerate the helicopter towards its best-angle-of-climb speed. The helicopter hit the lake surface and came to rest on the shore of the lake. All of the occupants were injured and the helicopter was destroyed.

CAA Occurrence Ref 06/4608

ZK-RKK Paul Scherrer KB3

Date and Time:	3-Nov-08 at 11:00
Location:	Featherston
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private Other
Age:	45 yrs
Flying Hours (Total):	101
Flying Hours (on Type):	83
Last 90 Days:	21

The accident occurred on the second flight of the day. The gyrocopter took off to the north. The pilot pre-rotated the rotor up to 200 rpm. He stated that the gyrocopter seemed to take longer to get up to rotor speed during the takeoff roll. The gyrocopter lifted off, got to twice the height of nearby trees, and started to sink in a downdraught. The pilot turned the aircraft to the west to try to gain height. The sink continued, and the pilot turned back to the east to avoid trees to the west and north of the airstrip. The gyrocopter landed heavily, rolling onto its right side 400 metres off the end of the strip. The gyrocopter suffered substantial damage to rotor, engine, tail and frame. The pilot was uninjured.

CAA Occurrence Ref 08/4626

ZK-HWF Robinson R22 Beta

Date and Time:	3-Dec-08 at 7:20
Location:	13 SW Blenheim
POB:	2
Injuries:	0
Damage:	Destroyed
Nature of flight:	Transport Passenger A to B
Pilot Licence:	CPL (Helicopter)
Age:	45 yrs
Flying Hours (Total):	1613
Flying Hours (on Type):	960
Last 90 Days:	119

The helicopter pilot aborted a landing attempt due to strong winds. While turning downwind for a second attempt, the helicopter encountered sinking air and settled onto a hillside and rolled over.

CAA Occurrence Ref 08/5005

ZK-HPR Robinson R44

Date and Time:	21-Dec-08 at 14:00
Location:	Rangitata Island
POB:	0
Injuries:	0
Nature of flight:	Agricultural
Pilot Licence:	CPL (Helicopter)
Age:	56 yrs

The pilot vacated the aircraft leaving the controls unattended in order to discuss the job with the landowner. The helicopter became airborne and rotated 180 degrees before landing on its skids, damaging the main rotor blades and tail boom. The aircraft flight manual contains a caution to never leave the helicopter flight controls unattended while the engine is running.

CAA Occurrence Ref 08/5260

ZK-HVX Schweizer 269C-1

Date and Time:	25-Jan-09 at 9:30
Location:	Thames
POB:	2
Injuries (Serious):	1
Damage:	Destroyed
Nature of flight:	Training Dual
Pilot Licence:	PPL (Helicopter)
Age:	23 yrs
Flying Hours (Total):	139

During a local area scenic flight, the pilot descended without authorisation into a low-flying area. During the low-level flight, a manoeuvre to avoid higher mangrove trees was conducted, but there was insufficient height available to recover to level flight before impact with terrain.

CAA Occurrence Ref 09/141

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.

Key to abbreviations:

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

Cessna U206G

Alternator/Battery

Part Manufacturer:	Kelly Aerospace Concorde
Part Number:	DOFF10300B/RG2445
ATA Chapter:	2400
TSO hours:	1087.06

The pilot declared a PAN with an electrical system failure. Radar contact was lost followed shortly by a loss of communications. Approach established contact via cell phone and passed a landing clearance from the Tower. The aircraft landed safely. Maintenance investigation found the alternator and battery u/s. A new alternator and battery were fitted. The electrical system was confirmed to be charging and operational on the ground run.

CAA Occurrence Ref 09/6

Alpha R2160

Exhaust Gasket

Part Model:	A160
Part Manufacturer:	Alpha
ATA Chapter:	7800

On the downwind leg of the circuit the crew noticed an exhaust fume smell in the cockpit, and the carbon monoxide detector turned grey. The crew landed the aircraft without incident. During inspection the exhaust gasket was found to leak. The exhaust nuts were re-torqued to the correct value.

CAA Occurrence Ref 09/1361

Beech 76

Not Known

ATA Chapter:	3200

On turning inbound for the VOR/DME 18 approach at Rotorua, the landing gear was selected down, but the gear did not extend. The aircraft continued the approach with the pilot intending to carry out the emergency extension procedure over Lake Rotorua once he had broken visual. On reduction of airspeed the gear extended. The pilot elected to complete a fly past of the Tower to confirm that the wheels were down – this was confirmed. The pilot elected to continue VFR to Auckland International with the gear down, where a landing could be made closer to maintenance facilities. The aircraft landed safely. Maintenance investigation could not determine the cause of the problem. On subsequent flights, gear operation was normal.

CAA Occurrence Ref 09/7

Cessna 185A

Rudder Pedal Torque Tube

Part Model:	0411306-10
Part Manufacturer:	Cessna
Part Number:	0411306-10
ATA Chapter:	2721
TTIS hours:	17625.2

During the landing roll out in the 3-point attitude, the aircraft started to veer to the left. The aircraft failed to respond to right rudder input. Directional control was regained by application of the right brake. Maintenance investigation found that the right rudder pedal torque tube stub had fractured around the weld. The torque tube was repaired iaw AC43.13.1B. Both torque tubes were modified to the latest status with doublers fitted to the aft portion of the stubs. The maintenance provider has added inspection of the torque tubes to the 50-hour inspection schedule. CAA investigation revealed two other previously reported defects of this nature. Continuing Airworthiness Notice 27-002 Cessna 180 and 185 Series Aircraft Rudder Pedal Assemblies has been issued. This advises operators/maintainers of Cessna 180/185 series aircraft to comply with the rudder pedal assembly and linkage inspection requirements and inspection intervals (200 hrs) as specified by the manufacturer.

CAA Occurrence Ref 09/45

Piper PA-28-181

Cylinder Assembly

Part Model:	0-360-A4M
Part Manufacturer:	Lycoming
Part Number:	05K21104
ATA Chapter:	8530
TTIS hours:	1202

The cylinders were removed from the engine by maintenance to investigate the cause of aluminium in the oil filter. Piston pin plugs P/N 60828 were found installed and worn. The number one forward piston pin plug was found not installed, causing scoring damage to the cylinder bore wall and piston. Lycoming Service Instruction 1267C requires fitment of aluminium bronze plugs P/N 72198 at overhaul. The maintenance provider who previously overhauled the engine determined that the missing piston pin plug would have inadvertently dropped out of position due to the engine being in a vertical position during assembly. Possible human factors involvement due to distraction, ie, phone call or dealing with customers, could have been a factor. The engine assembly worksheet now includes a stage inspection to check for piston to rod assembly. It was the maintenance provider's practice at the time to install the P/N 60828 plugs due to a previous failure of an aluminium bronze plug P/N 72198. It is now policy to fit the P/N 72198 plugs, as industry reports no further known issues with these plugs.

CAA Occurrence Ref 09/1023

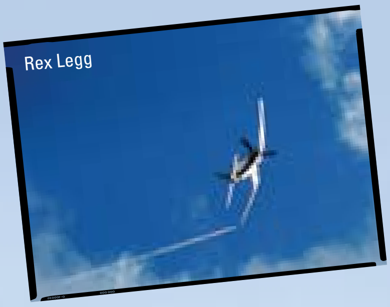


Photo Competition

Get your cameras out for summer and take some stunning aviation photos!

You can then enter your best shots in our competition. There will be 13 photographs selected to feature in the 2011 CAA Calendar (there's no prize as such – just the honour!).

Anyone can enter – just make the shots digital, and give us the rights to use them for any of our publications, and that's all there is to it.

In selecting the 13 winners, we'll be trying to represent the depth and breadth of the whole civil aviation community in New Zealand. That's from airliners to paragliders, and not forgetting aerodromes, air traffic control, and engineering. Make sure you enter to highlight your role in the aviation community – airliners, engineering, and aerodromes were under-represented last year.

Here's a great opportunity to showcase your company – enter your publicity shots.

Name

Email (required)

Address

City

Postcode

Number of photos entered

Number of disks supplied

In signing this entry form, I agree to all the Conditions of Entry, and I declare that the rights to the images entered are mine, and that I agree to the Civil Aviation Authority of New Zealand having the rights to reproduce them as detailed in the Conditions of Entry.

Signed

Date / /

If a person can be recognised in the photo entry, they must consent as below:

I consent to my image appearing in the photo(s) entered in this competition, and I also consent to all the usage rights detailed in the Conditions of Entry.

Signed

Date / /

Conditions of Entry:

1. Each entrant can submit as many photographs as they like.
2. The entrant can be anyone (including professional photographers), but they must be the photographer of the image submitted and hold all rights for that image.
3. All photographs submitted must illustrate some aspect of New Zealand civil aviation activity. There will be a preference for photographs of various aircraft categories in the air, but we also want to encourage entries showing other activities, such as engineering and air traffic control. The photographs can be of an overseas aircraft, providing the operator holds a New Zealand certificate.

   If an entry shows a recognisable person (ie, you can see their face clearly), it must be accompanied by a 'model release' form signed by that person agreeing to the terms of this competition, or use the form below.
4. All entries must be in digital format, as TIFF (preferably), or JPEG files.
5. All entries must be of sufficient quality to be printed A4 size landscape format (to the edges) at 300 dpi.
6. For all entries, the entrant gives the Civil Aviation Authority of New Zealand rights to reproduction of the photograph in print or electronic media (this includes the World Wide Web), worldwide, for all time.
7. Entries will only be accepted by post on CD or DVD disks.
8. Entries must be accompanied by the official entry form – one form per person entering.
9. Entries must be received by the CAA no later than 1 June 2010. Send to: Photo Competition, Civil Aviation Authority, P O Box 31-441, Lower Hutt 5040.
10. By submitting a photograph, entrants acknowledge understanding of, and acceptance of, these Conditions of Entry.
11. The judges decision is final and no correspondence will be entered into.


Photo Competition
Get your cameras out for summer and take some stunning aviation photos!
You can then enter your best shots in our competition.
See entry form over page.
CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND
Photo: ©istockphoto.com/Vuk8691/Kativ