November / December 2009

POINTING TO SAFER AVIATION

vector

Unsafe Undercarriage

Flying Tips for Summer

Asymmetric Flight

Pilot-In-Command

CAA
CIVIL AVIATION AUTHORITY
OF NEW ZEALAND

vector

3 Unsafe Undercarriage

It is important to know your undercarriage system: how it works, what could potentially go wrong, and what to do if you get an undercarriage unsafe indication.

6 Flying Tips for Summer

Tips for a summer of safe aviating. Making sure you and your aircraft are prepared and airworthy is particularly important when you have both been hibernating over winter.

10 Asymmetric Flight

The article concludes our series on asymmetric flight. This time we look at the practical aspects of the engine failure scenario, with particular emphasis on the takeoff.

18 Pilot-In-Command

When you are pilot-in-command there is a lot of responsibility on your shoulders. We give you a few reminders of those responsibilities and look at the requirements you must meet before you can act as pilot-in-command.

In this issue...

Cover: The crew of this Raytheon 1900D made a text book wheels-up landing at Woodbourne on 18 June 2007. Photo courtesy of Derek Flynn, *The Marlborough Express*.

Published by
The Communications and Safety Education Unit of the Civil Aviation Authority of New Zealand, P O Box 31–441, Lower Hutt 5040, New Zealand.

Tel: +64–4–560 9400,
Fax: +64–4–569 2024,
Email: info@caa.govt.nz.
Published six times a year, in the last week of every odd month.

Manager Communications Bill Sommer.

Editor Peter Singleton.

Safety Education Publishing Team
Clare Ferguson, Lakshmi Guda, Anna Walkington, Rose Wood.

Design
Gusto.

Publication Content
Unless expressly stated as CAA policy, the views expressed in *Vector* do not necessarily reflect the policy of the Civil Aviation Authority. Articles are intended to stimulate discussion, and nothing in *Vector* is to be taken as overriding any New Zealand civil aviation legislation, or any statements issued by the Director of Civil Aviation or the Civil Aviation Authority of New Zealand.

Reader comments and contributions are welcome and may be published, but the Editor reserves the right to edit or abridge them, and not to publish those that are judged not to contribute constructively towards safer aviation. Reader contributions and correspondence regarding the content of *Vector* should be addressed to: *Vector* Editor, P O Box 31–441, Lower Hutt 5040, or email: info@caa.govt.nz.

Free Distribution
Vector is distributed automatically to all New Zealand flight crew, air traffic controllers, aircraft maintenance engineer licence holders, aircraft owners, most organisations holding an aviation document, and to certain other persons and organisations interested in promoting safer aviation.

In the case of flight crew and air traffic controllers, a current aviation medical certificate must be held, and a current New Zealand address given, to ensure magazine entitlement.

Holders of Pilot Certificates issued by Part 149 certificated organisations can also apply to receive a free *Vector* (see the CAA web site for details). *Vector* also appears on the CAA's web site: www.caa.govt.nz.

Change of Address
Readers receiving *Vector* free of charge should notify info@caa.govt.nz of any change of address, quoting your CAA Client Number. Paying subscribers should notify The Colour Guy.

Paid Subscriptions
Vector is available on subscription only from The Colour Guy, P O Box 30–464, Lower Hutt 5040, Freephone 0800–438 785.

Unsafe Undercarriage

It is important to know your undercarriage system: how it works, what could potentially go wrong, and what to do if you get an undercarriage unsafe indication.

Common Undercarriage Problems

Knowing how your undercarriage, electrical, and hydraulic systems work, and conducting a thorough preflight, will help you to anticipate and possibly avoid potential undercarriage problems.

A couple of likely causes of gear extension problems are a loss of hydraulic fluid, or electrical malfunctions, so during your preflight look carefully for fluid leaks around the undercarriage system, and check fluid reservoirs if they are easily accessible.

Find out about previous undercarriage issues experienced by your aircraft type, and if any gear-related Airworthiness Directives have been issued. Make sure you incorporate checks for these into your preflight. For example, a PA-31 Navajo made an emergency landing at Napier when a flat oleo strut (due to low oil levels) meant the gear up-lock hook was unable to release the right main gear. A careful check of the oleo while preflighting a PA-31 is therefore recommended. For more information on this event see the September/October 2003 issue of *Vector*.

Knowing your systems is also important because an engine failure or electrical failure in some aircraft may have implications for operation of the landing gear. For example, in the Beech 1900D, if you have a failure of the centre electrical bus, you lose the landing gear motor, so a manual gear extension will be required.

What To Do

Depending on your aircraft type, a gear unsafe situation may be indicated by: a red gear unsafe light, having only two green lights illuminated, or contradicting indications. An example of a contradicting indication would be if three green lights are illuminated, but the gear handle is in the 'up' position.

A gear unsafe light could simply be an indication issue due to a blown light bulb, or failed microswitch, but until you can confirm this, you must treat the situation as real.

Continued over ❯❯

PA-31-310 Navajo landing gear

» *Continued from previous page*

- Check that the bulbs are not blown or dimmed. For example, on older Seneca models, having the navigation lights on dims the gear lights, making them hard to see in daylight. It is recommended to carry spare bulbs.
- Wriggle the light holder to check for loose connections.
- Use the 'press to test' button, to check if the annunciator lights are working correctly.
- Recycle the gear, being careful to observe the gear speed, and gear cycles as your aircraft may have a maximum number of cycles in a time period.
- Go around and stay in VMC if possible.
- Notify ATC or circuit traffic of the situation.
- If possible, visually check if your gear is down (use mirrors if fitted).
- Check your electrical system. For example, look for popped circuit breakers.
- Check that the manual gear extension lever is stowed correctly. If it is not, this may stop the automated gear extension system from working.

There are several methods you can use to confirm whether your undercarriage is down and locked, or not:

- Depending on your aircraft type, it may be helpful to check for resistance in the manual gear extension lever. If the gear is down and locked, you should feel maximum resistance.
- If you fully close the throttles/power levers, the gear warning horn should sound and/or a visual warning should occur if the gear is not down and locked.
- If you select landing flap, an aural and/or visual warning should occur if the gear is not down and locked.
- In aircraft fitted with an Enhanced Ground Proximity Warning System (EGPWS), you will hear a 'too low – gear' warning if you descend below a pre-set altitude (for example, 500 feet agl) and speed, and the gear is not down and locked.

If none of these initial actions resolves the situation, then carry out the emergency procedure documented in the Flight Manual.

While carrying out the Flight Manual procedures, it is also prudent to do the following:

- Declare a MAYDAY, and request emergency services to be on local standby.
- Review your evacuation procedure, and brief your passengers, paying particular attention to the brace position.
- If you are in IMC, ideally divert to an aerodrome where you can land in VMC.
- Aim to land with minimum fuel.
- Reduce any unnecessary electrical load.
- A manual gear extension can be up to 100 pumps, so give yourself plenty of time to do this. If you are in VMC, extend the gear before you intercept the approach profile.

Take Care of Your Undercarriage

A recent wheels-up landing occurred due to failure of the nosegear. This happened because the aircraft owner had been using a golf cart to tow the aeroplane around without any turning limit marks on the strut. Consequently, the nose gear was stressed from turning too tightly, and when selected up – stayed up and wouldn't come down.

If you are going to tow your aircraft, make sure you have stop marks on the strut and observe the turning limits. This incident also emphasises the importance of a good walk-around before flight.

The top five ways to take care of your undercarriage:

1. Observe the speed limits for extension and retraction.
2. Observe the gear cycle limits within a certain time period.
3. Check for hydraulic fluid leaks, and if possible check reservoir levels.
4. Check the oleos are set at the correct position.
5. Observe the towing limits, particularly the turning circle.

» Be aware that once you have manually extended the gear, you may not be able to retract it. If the weather is marginal at your destination aerodrome, consider a circling approach so you can extend the gear downwind in VMC. This way, if you have to carry out a missed approach, your aircraft performance will not be limited by dangling gear.

» When extending the gear manually, slow down to as low an airspeed as practical (in accordance with the Flight Manual). This will reduce the air-loads on the nose gear during extension, ensuring the greatest probability of the gear extending correctly.

» Pump the gear until you ideally achieve a gear down and locked indication (usually 3 greens). If this does not happen, continue pumping until you achieve maximum resistance. Check in your Flight Manual whether or not you should stow the manual gear extension handle after use.

» Land on a sealed runway, as you will have better directional control. If you land on a grass runway, there is a higher chance of part of the aircraft digging into the ground, reducing your chances of a successful wheels-up landing.

» Minimise your rate of descent on approach and at impact, and fly at the minimum safe airspeed.

» Unless your Flight Manual dictates otherwise, land as flat and as straight as possible to distribute the impact over a wider area of the aircraft fuselage.

If you encounter problems retracting the gear after takeoff, do not continue. Return to your departure aerodrome as your performance will be compromised, and you may no longer have enough fuel for your intended flight.

There have been a few instances recently where pilots have been somewhat casual in their handling of unsafe undercarriage situations. One such incident stated, *"The pilot reported joining with an undercarriage unsafe indication. No emergency was declared. The pilot elected to make an approach and overshoot for the controller to confirm the undercarriage status, which appeared down. The aircraft landed without further incident."*

Ground observers cannot confirm your undercarriage status. They can only tell you if your gear is dangling, not if it is locked. If you are in any doubt about whether your gear is down and locked, treat the situation as real and follow the emergency procedure in your Flight Manual. ■

The nose gear on this Piper PA-23-250 collapsed on landing. For more information on this accident see Accident Briefs, page 26.

Flying Tips for Summer

Summer is almost upon us. Now is the time when many of us get back into flying again. But before you take off, make sure you are current and your aircraft is airworthy, and remember these summer tips and usual courtesies.

Daylight Saving

Daylight saving has begun, so take this into account for flight planning and when interpreting weather reports – be alert with your calculations. Remember that NZDT is 13 hours ahead of UTC.

The CAA Weather Card includes a UTC calculation table on the side that is handy – email info@caa.govt.nz if you don't already have one.

Weather

Don't be complacent about the weather just because it's summer. There can be strong and gusty winds, aggressive thermals, and towering cumulus formations throughout summer.

Always do a weather check as part of your flight planning, use MetFlight GA, http://metflight.metra.co.nz, and include the ARFORs, TAFs, and METARs in your considerations, and combine these with your observations of actual conditions to form the big picture.

Also be aware of your limits and the limits of your aircraft.

Flight Planning

We've highlighted some of the known summer events on the back cover of this *Vector*. This is to alert you to possible busy traffic areas. But your flight planning should always include a check of the *AIP Supplement* and NOTAMs, www.ifis.airways.co.nz.

Ramp Courtesy

Summer means a busier time at most aerodromes/airfields. When you are refuelling, don't forget ramp courtesy. When you have finished refuelling your aircraft, make sure you move it clear of the pumps. Also, before you start up, check that your prop blast won't affect other aircraft or open hangars.

Carburettor Ice

In general, carburettor ice should be expected when the outside air temperature is between –10°C and +30°C with high humidity and visible moisture present. However, it is most likely between +10°C and +15°, with a relative humidity above 40 percent.

Grass Runways

With the availability of grass runways in the summer, there is an increase in the amount of grass seed found in carburettors. Generally, this is due to the carb heat being selected to HOT while on the ground. Be careful when operating

Photo: ©istockphoto.com/tvr_jp

from grass runways. A seed in the wrong place could ruin your whole day.

Just because grass runways become available, doesn't mean they are going to be in top condition. They may still be soggy and wet grass can seriously degrade your braking performance. You may need to increase your takeoff run.

Make sure that you identify the runway you intend to use properly. There have been many incidents of aircraft landing between the grass runway and the sealed runway because they did not correctly identify which bit of the grass area they were supposed to land on. Check the aerodrome charts in *AIP New Zealand, Vol 4,* available free on the internet, www.aip.net.nz, and look out for the marker boards.

High Temperatures

Higher temperatures will adversely affect your aircraft performance. When operating from aerodromes with a high elevation on hot days, always do performance calculations before taking off or landing.

Windscreens

Keep them clean. In summer, they tend to get covered by bugs, so make sure you always take a cleaner with you, and keep the cloth clean.

Dehydration

Higher temperatures mean that you have to increase your liquid intake to avoid dehydration while flying. Make sure you have a supply of drinking water on board the aircraft while flying.

Nests

Springtime is nesting time for birds. They will build their nests in any place that takes their fancy – and your aircraft is no exception. In fact, engine bays or tail cones seem to be favoured locations. And it's not only birds – keep an eye out for rodent nests too.

Give your aircraft cavities a thorough check. It may be worthwhile taking cowlings off to have a closer look. Engine bungs may not be enough to stop nesting birds on a mission, as there are plenty of ways a bird can get into an engine bay – and there may only be a few strands of grass as clues that you have an unwanted visitor on board.

Aircraft Currency

A thorough preflight is a must. While looking for birds' nests, re-familiarise yourself with your aircraft's features.

Carry out a thorough check of your maintenance logbooks and Technical Log. Make sure there is a current Annual Review of Airworthiness, and that all ADs and maintenance requirements have been met.

Check to make sure your emergency equipment is serviceable and current.

Now is the right time to fill in your aircraft operations statistics forms (CAA 605a or 605b – see the related article on page 20). Remember to fill in your statistical returns, even if you haven't done any flying. Otherwise a statistical average will be recorded for your aircraft.

Pilot Currency

Is your medical current? If not, you may need to allow some extra time to complete the various tests required.

Continued over ❯❯

» *Continued from previous page*

Is your BFR current? This can also take a few days to complete, as you need to complete all elements of the BFR, including items such as crosswind landings. Get one of the CAA reminder bookmarks that slot into your logbook to help you keep track of your currency. Email info@caa.govt.nz if you would like one. Even if you don't need to do a BFR, it may be worth doing a check ride with an instructor, or taking a safety pilot.

Are you current on type? Take all opportunities to do some armchair flying. Run through the emergency procedures, and those skills you haven't used for a while. Revisit the location of all the controls with your eyes closed. You can also do this in the aircraft while it's in the hangar.

The new aeronautical charts became effective 19 November 2009, and are available from the Aeronautical Information Management Unit of Airways. Email aim@airways.co.nz, or telephone 0800 500 045 to get your copies. Make sure your charts are up to date.

For some reminders on your responsibilities as pilot-in-command, see the article on page 18.

Thermal Runaway

Thermal runaway is a problem particular to nickel-cadmium (Ni-Cad) batteries, especially during a long start, or when the battery hasn't been used for a while. During the start, a large drain on the battery occurs and the battery gets warm. Once the engine is started and the generator is recharging the battery, a high current is put back into the battery. Normally, the current reduces as the charge is built up, but where there is a temperature imbalance between cells, the current will continue to increase. The increase in current leads to an increase in temperature, which in turn leads to a further increase in current, and so on. This is thermal runaway and can lead to the battery exploding.

To avoid this situation, get your Ni-Cad battery serviced regularly. **Do not** try and jumpstart your aircraft if you have a flat battery, as the generator will charge the battery too rapidly.

If you do get thermal runaway (you will be able to identify this by a very high battery temperature reading on your battery temperature gauge) – land as soon as possible and leave the battery well alone. It will be some time before it is safe to handle. Get an engineer to sort it out.

Flying and Scuba Diving

Flying after diving can lead to decompression sickness due to bubbles developing in the body when subjected to a reduction in environmental pressure (decompression).

There are a number of variable factors, such as the number of dives, the depth of the dive, the pause between diving and flying. The effect is more likely if you fly at a high cabin altitude, so there's a heads-up for glider pilots, parachutist drop pilots, and those flying high in a non-pressurised aircraft, who also like to dive. It is known that repeated dives in a window of a few days can cause a build-up of nitrogen in the blood and this can lead to problems at altitude. You should also think of your passengers who may have been diving.

For divers who have had less than 2 hours diving in the last 2 days, a recommendation is to wait for 12 hours before flying. After multi-day unlimited dives, you should wait at least 24 hours. After any dives requiring decompression stops, a delay of at least 24 hours, and preferably 48 hours, is suggested.

Anyone who has been diving, regardless of whether they have been through decompression, may still have small bubbles. While not enough to cause a problem on the surface, they may expand at altitude, causing decompression sickness. Keeping dives conservative will reduce the risk of bubbles.

To improve your risks even further it is recommended that any diving be avoided in the last 48 hours before flying.

Alcohol

Many summer activities involve the consumption of alcohol, and this includes club or group fly-aways, so be aware of the effects of alcohol. It can ruin your morning with a hangover, but can also affect your balance and cause vertigo.

The effects vary with individuals, and the figures are less for women than men, but generally speaking, after drinking one or two units, you should wait at least eight hours before flying. The time extends as you consume more, so after two to four units, you should wait at least 12 hours. After six units (four for women), you should wait 48 hours before flying. Incidentally, at that level, you should consider the affects on your health. See www.alcohol.org.nz for more information, including what is meant by a "unit".

The after-effects, including effects on your vestibular (inner ear) system, can last well beyond the time that all alcohol is out of your bloodstream.

The bottom line is that you must be fit to fly.

Medical Conditions

You are required to report all medical conditions if they have any short or medium-term effect, as well as any changes in existing conditions. Under the Civil Aviation Act and Rules, a pilot who experiences a known medical deficiency, an increase in a known medical deficiency, or a medically significant condition for longer than seven days, must not return to flight duty until examined and certified fit by a Designated AME or the CAA's Principal Medical Officer. When applicable, a copy of the certification is to be provided to the Chief Pilot. ■

Chrome Alert

Chrome plating was often used on engine cylinders to reduce wear, and to refurbish them after rework or repair. Chrome plated rings cannot be used with chrome cylinders, because chrome on chrome causes serious friction and the metals will seize together. The chrome can detach itself and enter the entire engine lubrication system.

A colour coding system is used on cylinders to identify a number of aspects, including whether the cylinder is chrome plated (orange), or nitride hardened (blue). In addition, the cylinder part number usually has a "C" added if the cylinder is chrome plated, but this is not always the case.

The importance of having the correct colour coding on engine cylinders has been highlighted in a recent incident, where chrome piston rings were fitted to a piston in a chrome bore. Due to this error, the aircraft experienced falling oil pressure, increasing oil temperature, and reducing power. The pilot had to make an emergency landing.

Investigation revealed that the cylinder had been **colour coded incorrectly**. During the repair the colour coding was followed, and as a result the wrong piston rings were fitted. This is a very good example of how, without correct visual indicators, a latent failure to correctly carry out maintenance many years ago was a contributing factor, or a link in a chain of events, that has led to an aircraft incident.

Subsequent research of the engine logbook has indicated that a number of cylinders were replaced over 20 years ago. It would appear from evidence gathered, that either the cylinders where not correctly identified at the time as having chrome bores by colour coding, or that identification has subsequently worn away, or been removed, and incorrectly re-identified.

Chrome plated cylinders should be colour coded orange and have "C" added to the part number.

If you are not sure and need to verify the bore type (it may not be visually obvious), there are a number of ways in which you can identify chrome or nitride hardened cylinders. Apply some copper sulphate solution to the bore. If this leaves a copper coloured deposit, this indicates a steel or nitrided bore. If there is no deposit, this indicates a chrome bore. Alternatively, you can apply some steel blueing compound to the bore. If it turns the bore black, this indicates a steel or nitrided bore. If nothing happens, this indicates a chrome bore.

The incident above is a good reminder that cylinders must *always* be identified correctly. ■

Asymmetric Flight
(Continued)

There are very few times in your flying career when you will need to take swift and accurate action to maintain the safety of the aeroplane, but an engine failure during takeoff is one of those times.

V_{MCA}	Minimum control speed airborne
V_{SSE}	Airspeed below which an intentional engine cut should never be made
V_X	Best angle of climb speed
V_Y	Best rate of climb speed
V_{XSE}	Best single engine angle of climb speed
V_{YSE}	Best single engine rate of climb speed
V_1	Decision speed
V_2	Takeoff safety speed

In the September/October 2009 *Vector* we examined asymmetric flight theoretically – this article looks at the practical aspects of engine failure procedures on takeoff, en route and on the approach.

The following is an extract from the Transport Accident Investigation Commission (TAIC) report into the ZK-TZC accident in 2002 at Feilding Aerodrome.

"With ZK-TZC at such a low circuit height and so close to runway 10 in the downwind position, the aeroplane, even with both engines operating normally, was unlikely to complete a successful landing. However, turning left toward a secured engine with the flaps and undercarriage extended exacerbated the situation, making a successful landing even less likely.

Photo: ©istockphoto.com/bpalmer

"The right engine was heard to be under high power, so the pilot had probably selected maximum power in an attempt to retrieve a worsening situation. If he had discontinued the circuit and retracted the undercarriage and flaps, he might have been able to gain airspeed and height and place the aeroplane in a better position to attempt a landing. What is evident though is the pilot continued with his improbable circuit, and allowed the aeroplane's airspeed to decay to such a point that he lost control at a height from which recovery was impossible.

"The control loss occurred because the pilot probably let the aeroplane's airspeed fall below the minimum single-engine control speed, which brought about an uncontrollable yaw and rapid roll towards the inoperative left engine."

Basic Single-Engine Procedures

It is critical that you know and follow the single-engine emergency procedures for your aeroplane. The basic fundamentals of all the procedures are:

» Maintain aircraft control and airspeed at all times.

» Apply maximum permissible power to the operating engine.

» Reduce drag to an absolute minimum.

» Secure the failed engine and related sub-systems.

The first three steps must be done promptly and from memory. Then consult the checklist to confirm the inoperative engine is secured and the switches are in the correct positions. To achieve handbook performance, the aeroplane must be banked towards the live engine ('raising the dead') with the balance ball off-centre towards the live engine.

After the first step has been achieved, you may need to modify the other steps.

If the engine fails when only a low power setting is required, you may chose to use just enough power to maintain a safe airspeed and altitude, or to maintain the rate of descent.

If the engine fails while on final approach, use power and flap as necessary to maintain as normal an approach profile as possible.

Be sure to confirm the dead engine positively before feathering it. Many red-faced pilots – both students and veterans – have feathered the wrong engine. Follow this sequence:

» Identify the suspected engine (ie, dead leg means dead engine).

» Verify with cautious throttle movement of the suspected dead engine. There should be no change in the yaw. If the failure does occur at a low power setting, an increase in power may help you correctly identify the failed engine.

» Then feather the engine.

Planning the Normal Takeoff

Every takeoff plan must take into account:

» Aeroplane type
» The load
» Centre of gravity
» Runway length
» Obstacles
» Engine failure.

The list of variables goes on, and their importance increases as the runway gets shorter and the load increases.

Continued over ❯❯

» Continued from previous page

Always plan your takeoff knowing what your actions will be if an engine fails. Be aware of what performance to expect and the safest flight path option. For example, if your aircraft will not maintain altitude on one engine, and an engine fails shortly after liftoff, you will be landing in the most suitable area nearby. Having considered the surrounding area, you will have a definite direction of flight (or circuit) in mind.

Do not run out of altitude, airspeed and ideas all at the same time!

It is critical that you fly the aeroplane with precision in order to obtain maximum performance and safety. Rotate at a specific airspeed, accelerate to a specific climbing airspeed, and climb with maximum permissible power to a safe single-engine manoeuvring altitude. If an engine fails, you need to achieve the single engine airspeed – and hold it precisely – as this is the only airspeed for maximum performance.

Let's look at liftoff speed. A light-twin can be controlled satisfactorily on the ground in the case of engine failure below V_{MCA} (minimum control speed airborne) during the takeoff roll. This is done using rudder, brakes, power, and nosewheel steering. If the aeroplane is airborne below V_{MCA}, however, and an engine fails, you will not be able to accurately control the direction you are flying. Consequently, do not lift off until the takeoff safety speed is reached.

On initial climb-out, climb at V_Y (best rate of climb speed) until you reach a safe single-engine manoeuvring altitude. This altitude will be dictated by several factors, but in particular it must be high enough to clear any obstacles in the circuit area. If your aircraft will not maintain altitude on one engine, you need to be high enough to see the surrounding terrain and fly to the most suitable landing area.

After reaching your safe single-engine manoeuvring altitude, you can accelerate to the cruise climb airspeed which may be V_Y + 10 to 30 knots. Use of cruise climb airspeed will give you better engine cooling, increased in-flight visibility, and better fuel economy.

At the first indication of an engine failure during climb-out, quickly establish V_{YSE} (best single engine rate of climb speed).

Obstacle Clearance Takeoff

Climb speed for obstacle clearance should normally be V_X (best angle of climb speed) rather than V_Y (best rate of climb speed).

The problem here is that in some light twins, V_X may not be much greater than V_{MCA} (minimum control speed airborne). So if an engine fails while climbing at V_X, it is possible the airspeed could decay to below the point where directional control is lost (due to slow pilot reaction time and poor handling techniques). V_X is a speed that should be used for obstacle clearance only when absolutely necessary.

Single-engine climb performance can be very poor (sometimes non-existent), especially when operating at or near, Maximum All Up Weight (MAUW). The speed difference between V_Y, V_{YSE} (best single engine rate of climb speed), and V_{XSE} (best single engine angle of climb speed) can often be small and difficult to attain, and equally maintain, in rough air. It is therefore good aviation practice to reach a safe height above the terrain as quickly as possible by flying at V_Y. If it is possible to sacrifice some rate-of-climb, it is wise to climb initially at 5 to 10 knots above V_Y. For most light twins this still provides good climb performance on two engines and will make achieving V_{YSE} or V_{XSE} easier, should it become necessary. If you are climbing at below V_{YSE} or V_{XSE} you will normally have to sacrifice height to achieve the required airspeed – height that you may not have.

You must decide which airspeed to use for an obstacle clearance takeoff, considering all aspects of the problem before takeoff. If the figures look tight, don't takeoff in your current configuration. You will need to either reduce the weight or wait until conditions improve.

Engine Failure on Takeoff

If an engine fails in a light twin before reaching liftoff speed, discontinue the takeoff. The ability to takeoff on one engine will not be available to you until you fly aeroplanes that have that performance capability – typically Beech 1900s and above.

If the engine fails after liftoff, and touchdown and rollout on the remaining runway is still possible, the takeoff should still be discontinued. This is why it is important to leave the landing gear extended until a landing straight ahead is no longer possible.

If you are airborne and committed to fly (no more runway left), you need to attain V_{YSE}. If altitude cannot be maintained at V_{YSE}, continue to hold that speed because it will give the slowest rate of descent. If you find yourself in this position, or not being able to climb at all, your best option may be to close the throttle on the good engine and land straight ahead, rather than attempt to climb and lose control.

Photo: ©istockphoto.com/macroworld

Do not get into the position where you run out of altitude, airspeed and ideas all at the same time!

If you are only just able to hold altitude and airspeed and you can continue straight ahead, do not turn. If you do turn under these critical conditions, both lift and airspeed will be lost. Fly straight ahead until a safe manoeuvring height is reached. At this point you can bank safely in either direction.

Pilot Operating Handbooks have charts for calculating the runway length required if the engine fails before reaching liftoff speed. They may have charts showing performance after liftoff such as:

» Accelerate-stop distance. The distance required to accelerate to liftoff speed and, assuming engine failure at that point, to bring the aeroplane to a full stop.

» Accelerate-go distance. The distance required to accelerate to liftoff speed and, assuming engine failure on the critical engine at that point, to continue the takeoff on the remaining engine to a height of 50 feet.

Study your accelerate-go charts carefully. Few aeroplanes – including jets – are capable of climbing out on one engine under all weight, pressure altitude and temperature conditions – there will always be a trade-off. Know, before you taxi out, whether you can maintain control and climb out if you lose an engine. It may be necessary to off-load some weight, or wait for more favourable temperature or wind conditions.

Engine Failure En Route

Unlike engine failure during takeoff, when an engine failure occurs en route, there is time to consider the failure, determine the cause of the trouble, and to correct it, if possible. If engine power cannot be restored by carrying out the trouble checks, however, then complete the engine failure drills.

Single-Engine Approach and Landing

Some considerations when planning a single-engine approach and landing are:

» If you have to turn on the approach, the circuit must be wide enough to avoid making steep turns.

» Avoid getting low and slow – keep a minimum of V_{YSE} until landing is assured. A final approach at V_{YSE} requires the least amount of power.

» Plan the final approach path so that the least amount of power adjustment is required, and it is flown at a constant airspeed and rate of descent.

» The gear should be lowered in plenty of time to take corrective action if 'down and locked' indications are not received.

» When one propeller is feathered, drag is considerably reduced, resulting in a longer flare and landing roll. Make allowance accordingly as you fly the final approach.

» Be prepared for the aircraft to yaw towards the live engine as the power is reduced on touchdown.

» If a go-around is absolutely necessary, the aeroplane must be flown at V_{YSE}.

» Go-arounds should not be made once committed to the landing, ie, with the gear lowered. If anything gets in your way on the runway, you will have to avoid it as best you can. ■

Instructors, Pass On Your **Knowledge**

Instructors can significantly help out students and itinerant pilots by passing on the knowledge they have about operations at their local aerodrome. New VFR pilots, or those unfamiliar with an area, can easily be baffled by special local procedures, a complex mix of traffic, and IFR operations.

If you are an instructor at an aerodrome where your local procedures are a bit different from the norm, explain to your students why these procedures are in place, and make sure they know what to expect at a typical aerodrome. These are some of the things that can make an aerodrome 'different':

- circuit direction and/or shape is affected by terrain or airspace constraints;
- standard overhead joins are not used; or
- a particular group (such as parachute aircraft or gliders and tugs) use an opposite circuit direction.

Many unattended aerodromes around the country are used by a complex mix of traffic (for example: fixed wing and helicopter flight training, private and commercial operations, gliding, parachuting, light jets, and turboprops). Figuring out how to fit in among such a diverse mix of traffic is a challenge for new or unfamiliar pilots, and the prospect can be intimidating. Instructors can make this less daunting by explaining the limitations and needs of each group, and how best to fit in with, and accommodate, one another.

Remember that good communication, a careful lookout, and actually sighting traffic, are essential for safe circuit operations. Talking to your students about the relative speeds of each different aerodrome user will help them to judge their circuit spacing more accurately. If it is necessary to join downwind, rather than overhead, ensure that they have a thorough lookout for aircraft taking off or on crosswind.

If your aerodrome has IFR traffic, explain to your students where the IFR procedures will take the traffic, and what their radio calls mean, so they have some idea of where to start looking for the traffic. IFR pilots who are carrying out procedures at unattended

Photo: ©istockphoto.com/bestaviation

Going Somewhere New?

If you are an itinerant pilot flying to an aerodrome you are unfamiliar with, start by reading the *AIP New Zealand* aerodrome chart and current *AIP Supplement* thoroughly. Take note of any special local procedures or cautions mentioned in the *AIP*. Your research, however, should not stop there. Generally, these cannot be fully explained in just one or two lines of text, so it is a good idea to call the local aero club to find out more. Even if there is nothing out of the ordinary mentioned in the *AIP*, it is still worthwhile making a call as there may be unpublished local procedures in place, or agreements among aerodrome users. You can also take this opportunity to find out what the traffic mix is like there. The more information you can glean from local operators, the easier it will be to go somewhere new.

aerodromes can be helpful and considerate by making plain language radio calls for VFR traffic.

Hastings, known as Bridge Pa, is an example of an aerodrome with three complicating factors: a complex mix of traffic, special local procedures, and a mix of VFR and IFR users. The speed of aerodrome users ranges from 90 knots for a Piper Tomahawk in the cruise to 340 knots for the Citation Mustang. Gliders, tugs, and helicopters use a different circuit direction from all other traffic, and parachuting occurs onto the aerodrome.

Kevin England, Hastings Aerodrome Manager and Air Hawke's Bay Chief Executive, says the key to operating safely is to keep applying the basics, "using your eyes and ears, and communicating effectively.

"We invite other operators, such as the gliding club, to come and meet our students, and brief them first hand on the nature of their operation and the procedures they use.

"A good lookout is essential. Air Hawke's Bay Academy students go through a NORDO exercise, where the instructor on board is still listening to the radio, and making calls, but the student must practise joining the circuit without using the radio. This disciplines them to use their eyes, not just their ears."

Hastings aerodrome is available for general use subject to the prior agreement of the operator, Air Hawke's Bay.

"We encourage itinerant pilots to call Hastings Aerodrome prior to departure. We are more than happy to give them a briefing on the operations they can expect to encounter that day, and answer any questions they may have. The parachuting operator raises a flag an hour before the jump plane goes up, so we can let people know if they will encounter parachute operations. The jump pilots are very good at communicating what they are doing, and if we hear itinerant pilots on the radio, we are more than happy to help them out if necessary," Kevin says.

An incident reporting system is in place, and incidents are discussed when the Hastings Aerodrome User Safety Group meets, so that any lessons learned can be incorporated into the procedures used on the aerodrome.

"Good communication is what it all comes down to – both in the air, and on the ground. Talking about incidents with other aerodrome operators means we can improve awareness, and at the same time look to improve our procedures."

Reading *AIP New Zealand* and studying charts can only go so far to prepare you for a flight. Nothing beats the local knowledge of instructors who fly in that patch everyday. Instructors – value your knowledge and pass it on. ■

What is a **Finding?**

A Finding shows non-compliance with a Civil Aviation Rule or condition attached to an aviation document. The issue of a Finding by a CAA Inspector enables the operator to continue their operation while correcting the situation. It's a good system – the alternative would be that you could not operate while non-compliant.

The Big Picture

The Civil Aviation Act 1990 provides for the Director to carry out inspection and monitoring in order to check that aviation participants operate safely, in accordance with the prescribed safety standards, and in compliance with the conditions attached to their aviation documents. We use the term surveillance to encompass all the various inspection and monitoring activities.

Voluntary compliance by participants is a primary means of maintaining compliance in the civil aviation system. This important principle is the basis of the surveillance Finding and Corrective Action process, and underpins the CAA Surveillance Policy.

There's a whole section on surveillance on the CAA web site, www.caa.govt.nz, see "CAA Surveillance" on the home page. It includes the CAA Surveillance Policy document.

A Finding, issued as part of a safety audit or spot check, is part of the surveillance process.

The most important factor is to find out the cause or causes behind the Finding, and put steps in place to make sure the problem cannot happen again.

Findings

Safety audits can be routine scheduled audits, special purpose audits, or spot checks. They are a sampling process of an aviation organisation's activities and processes. Audits are not intended to substitute a participant's responsibility for self checking of their own compliance with legislative requirements. A CAA Inspector is legally obliged to record a finding of non-compliance.

Receiving a Finding is not necessarily a negative reflection on your organisation – it is a mechanism that will help you improve your own internal audits, and it assists you back into compliance. It only becomes a problem when it is ignored.

Similarly, having no Findings, while a good trend, does not necessarily mean that your organisation does not have any problems.

The CAA inspector and the document-holder agree on the corrective actions to be implemented, and the timeframe for this to happen, usually at the 'exit meeting'. The timeframe will be influenced by the classification of the Finding:

Critical – An occurrence or deficiency that caused, or on its own had the potential to cause, loss of life or limb.

Major – An occurrence or deficiency involving a major system that caused, or had the potential to cause, significant problems to the function or effectiveness of that system.

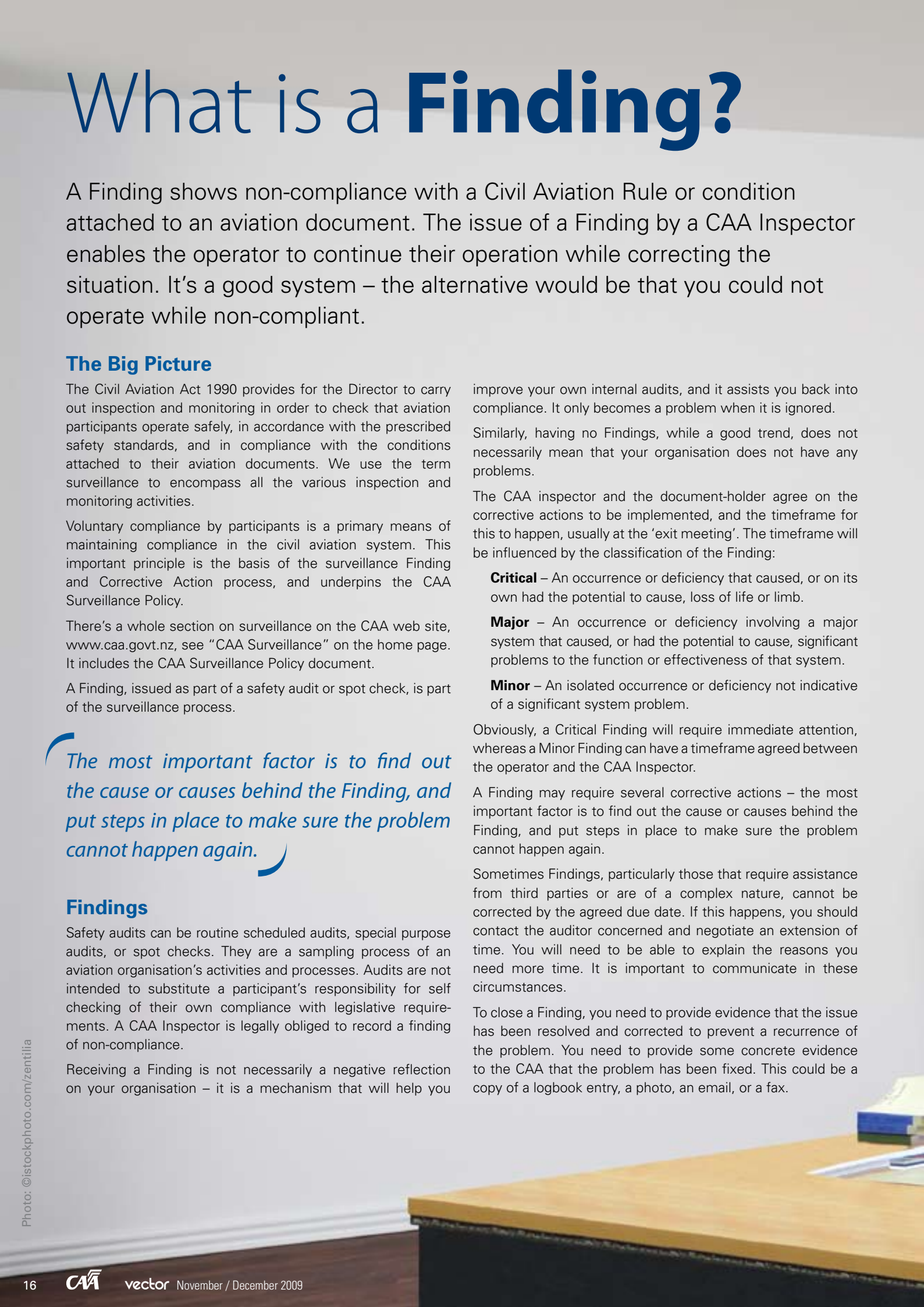
Minor – An isolated occurrence or deficiency not indicative of a significant system problem.

Obviously, a Critical Finding will require immediate attention, whereas a Minor Finding can have a timeframe agreed between the operator and the CAA Inspector.

A Finding may require several corrective actions – the most important factor is to find out the cause or causes behind the Finding, and put steps in place to make sure the problem cannot happen again.

Sometimes Findings, particularly those that require assistance from third parties or are of a complex nature, cannot be corrected by the agreed due date. If this happens, you should contact the auditor concerned and negotiate an extension of time. You will need to be able to explain the reasons you need more time. It is important to communicate in these circumstances.

To close a Finding, you need to provide evidence that the issue has been resolved and corrected to prevent a recurrence of the problem. You need to provide some concrete evidence to the CAA that the problem has been fixed. This could be a copy of a logbook entry, a photo, an email, or a fax.



Tracking

The Finding process provides a useful tracking mechanism for the CAA. If there are a large number of findings issued on a particular point, we can look to see if more safety promotion is required, or even whether the relevant rule might need amending.

Even Findings that might get closed immediately are recorded so that trends can be identified. Don't view this as a black mark against your operation – you're actually helping to inform the whole aviation safety system.

Within the overall surveillance process, Findings are also a component in establishing a risk profile of aviation participants. This, in turn, may influence the frequency of CAA surveillance, so those organisations with a consistently low risk profile might be considered for fewer inspections. ■

A Finding is defined as:

The act of identifying and concluding from objective evidence, a failure by a person or organisation to comply with a specified standard or a condition attached to an aviation document.

Ref: CAA Surveillance Policy

CAA's Airworthiness Inspector, Steve Shaw (centre), explaining a point to Bernie Robertson (left), and Jim Willcox of Aviation Radio, during a recent audit in Wellington.

Pilot-In-**Command**

Remember how it felt on your first solo when you, and you alone, were responsible for getting the aircraft back on the ground safely? Acting as pilot-in-command is a big responsibility.

When you are pilot-in-command you alone are responsible for the safe operation of the aircraft and the safety of everyone on board.

Before You Can Be Pilot-In-Command

In order to carry passengers you must:

- have a current appropriate medical certificate, and
- have completed a Biennial Flight Review (BFR) in the last 24 months, or completed the appropriate competency checks under your organisation's Air Operator Certificate requirements, and
- hold a Part 61 licence, and
- be type rated,

otherwise

- be authorised to practice solo, with a valid medical certificate.

Flight instructors – your annual instructor renewal does not double as a BFR. When your instructor rating lapses, you are no longer able to act as pilot-in-command unless you have completed a BFR in the last two years, otherwise student privileges apply and you require solo authorisation.

Responsibilities

Your most important responsibility is that you are responsible for the safe operation of the aircraft and the safety of its occupants. A big part of that, is that you are the person who is responsible for making decisions – and those decisions need to be well thought out and take all available information into account.

Currency

In addition to having a current medical and BFR, you must also remain current. This means that within the immediately preceding 90 days you must have:

- carried out 3 takeoffs and 3 landings, or
- satisfactorily demonstrated to an appropriately qualified instructor your competence in takeoff and landing manoeuvres, or
- have sat the licence issue test.

Photo: ©istockphoto.com/stphillips

Airworthy Aircraft

Before you fly an aircraft, you must be satisfied that it is airworthy and safe for flight. That involves checking the paperwork, such as the Technical Log and the aircraft documents, and doing a thorough preflight inspection.

Defect Recording

When you have finished the flight, you must record defects that occurred during the flight in the Technical Log – not on a random piece of paper or in a separate little book!

You can take advice from senior pilots and engineers about how to make entries in the Technical Log. The Technical Log is the only way you will know the maintenance state of the aircraft. If there is a recurring problem with the generator, for example, but it is not entered in the Technical Log, how will engineers and other pilots know that important information?

You may also need to check your operator's approved procedures for making Technical Log entries.

Commands

The pilot-in-command has the legal authority to give commands to anyone on board that aircraft that are necessary for the safety of the aircraft. This could range from giving instructions for an evacuation to how you want the aircraft loaded.

Loading

The aeroplane must be loaded so that it is within the weight and the centre of gravity limits, and the load is appropriately secured. You are responsible for checking this. You don't have to load it personally, but you must satisfy yourself that it is loaded as shown on the load sheet.

Safety Belts

You must make sure each passenger occupies a seat and fastens their safety belt for: takeoff and landing, when below 1000 feet, whenever you think it necessary for safety, during aerobatics, and anytime in an open cockpit aircraft.

Familiarity

It is important to be familiar with the Flight Manual, placards, instrument markings (including speeds), operating limitations, the location and use of emergency equipment, and procedures when using emergency equipment.

In order to be familiar with all information concerning your flight:

- you must understand the weather that is likely to affect your flight;
- determine how much fuel you will need to meet the flight requirements, including rule requirements and any organisation's reserve requirements;
- have enough information available to you during the flight to find and legally use an alternate aerodrome if needed;
- know which radio and navigation stations are available, and which are inoperative by checking the NOTAMs;
- know the expected conditions at your departure and destination aerodromes, by studying *AIP New Zealand* and checking the NOTAMs;
- know and be able to work out the performance you can expect from your aircraft, especially the takeoff and landing distances required, and what runway length is available at departure and destination;
- you must know your immediate actions by heart so that in an emergency situation you are able to respond promptly and appropriately; and
- if you fly twin-engine aircraft you must be able to work out one engine inoperative performance limitations and apply them to your flight (see the *Asymmetric Flight Continued* article on page 10).

Operating in Controlled Airspace

Before you operate in controlled airspace you must have a clearance. Once you have that clearance, and have accepted it by reading it back, you must follow it. Importantly, following a clearance does not mean you hand over the pilot-in-command decisions to air traffic control. If, for example, a clearance will put you into conflict with other traffic, or terrain, you must request an alternative clearance.

When operating at an aerodrome with an aerodrome control service, you must maintain two-way radio communications and obtain a clearance before taxiing, landing, taking-off, or entering a control zone.

There Can Be Only One

There can be only one pilot-in-command at a time. At the controls there can be:

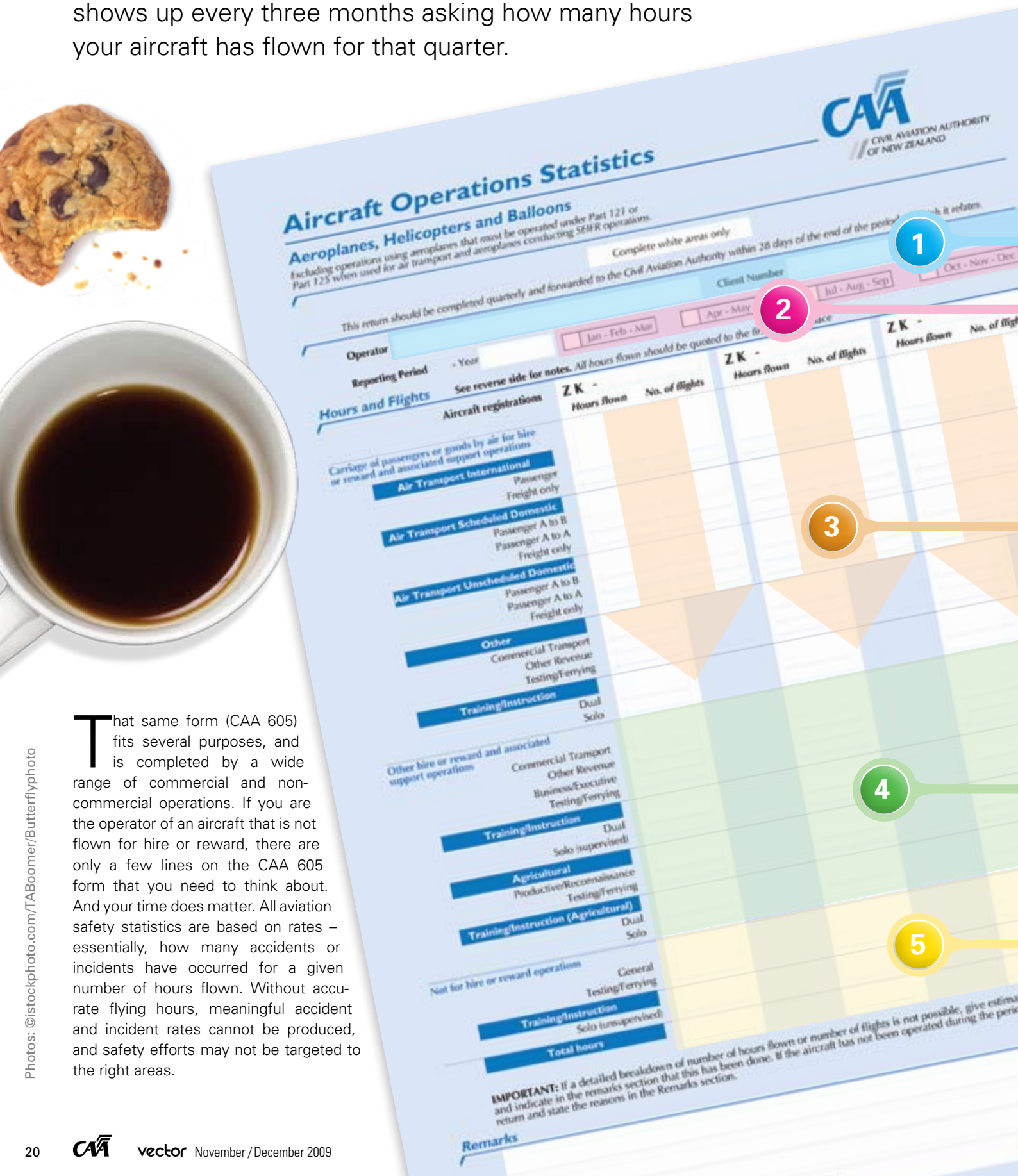
- one pilot-in-command and one pilot-in-command under supervision, or
- one pilot-in-command and one co-pilot – where the aircraft is approved for two-pilot operations, or the organisation has approved two-pilot standard operating procedures, or
- one pilot-in-command and one observer – where the observer is gaining experience in the operation, but cannot log the time.

There may be two appropriately qualified pilots at the controls, but only one is the pilot-in-command. Before you go flying make sure that it is very clear who is the pilot-in-command. There have been serious accidents where the pilot-in-command has taken instructions from someone they thought was more senior. If you are pilot-in-command, you are the person who makes the decisions, you can take advice from anyone you like, but in the end it is your call.

Remember, if you do **not** have a current medical, type rating, and BFR, you cannot take someone else who has, to 'cover you'. In this case, you would be the passenger and cannot act as pilot-in-command or log the flight time. ■

Doing Much **Flying?**

When you own an aircraft, a new crop of forms enter your life. Some of these can look complicated – especially the blue one that shows up every three months asking how many hours your aircraft has flown for that quarter.



That same form (CAA 605) fits several purposes, and is completed by a wide range of commercial and non-commercial operations. If you are the operator of an aircraft that is not flown for hire or reward, there are only a few lines on the CAA 605 form that you need to think about. And your time does matter. All aviation safety statistics are based on rates – essentially, how many accidents or incidents have occurred for a given number of hours flown. Without accurate flying hours, meaningful accident and incident rates cannot be produced, and safety efforts may not be targeted to the right areas.

Photos: ©istockphoto.com/TABoomer/Butterflyphoto

CAA Safety Data Analyst Paul Cooper feeds the data from aircraft operations statistics forms into the CAA safety database. He cross-checks the data, and weeds out the forms that seem unlikely or which have been filled out incorrectly.

"If you have not flown your aircraft for a quarter, make sure you enter zero and send the form in – otherwise your aircraft will be assigned an average number of hours. You can imagine how this might skew the safety statistics," Paul says.

It's also fine to send in your forms before you receive a request. They're available on the CAA web site www.caa.govt.nz, under Forms.

The first 13 rows on the form are for air transport operations only – if your aircraft is not used for hire or reward, you need only complete points 1, 2, and 5. ■

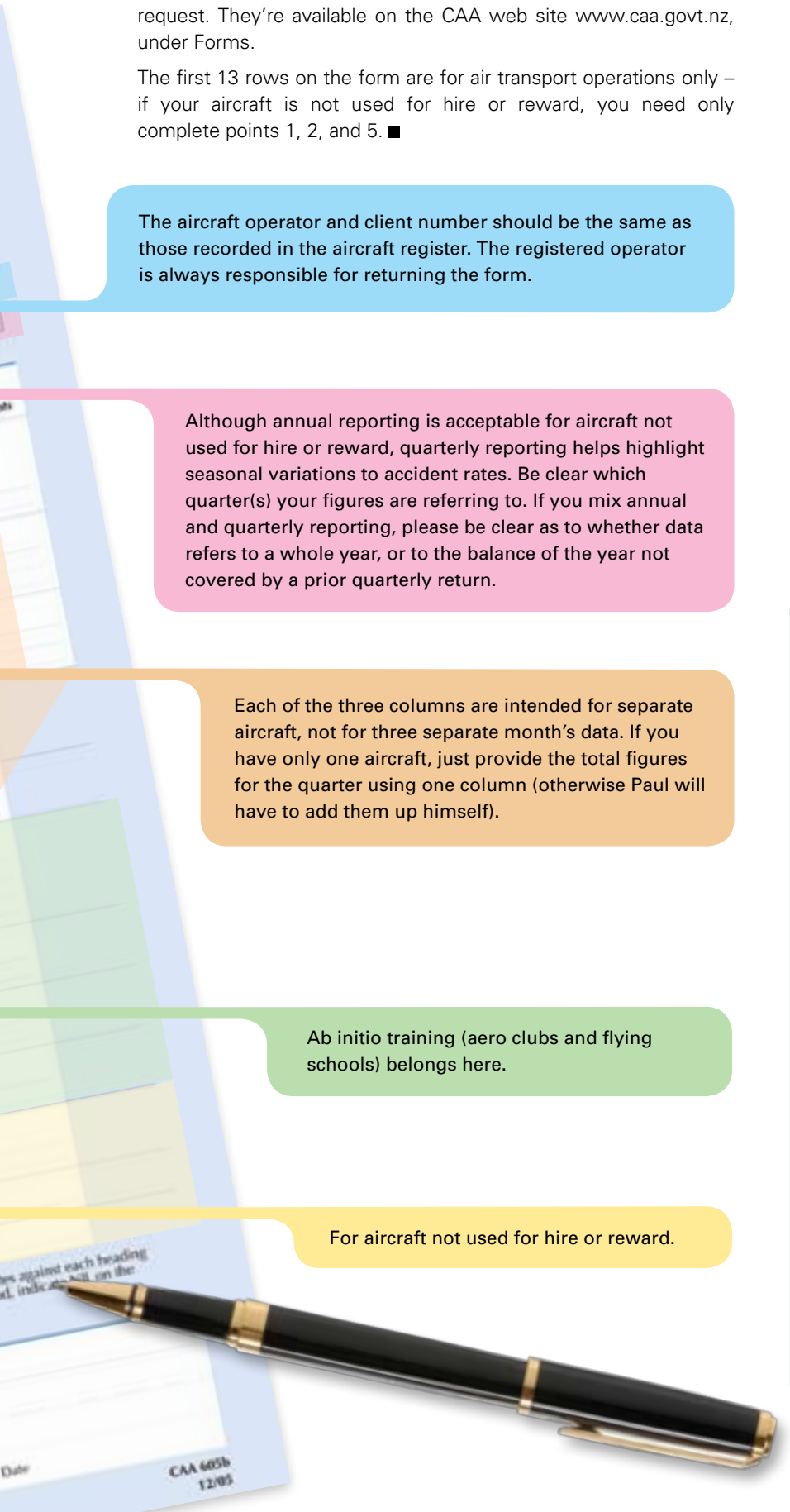
The aircraft operator and client number should be the same as those recorded in the aircraft register. The registered operator is always responsible for returning the form.

Although annual reporting is acceptable for aircraft not used for hire or reward, quarterly reporting helps highlight seasonal variations to accident rates. Be clear which quarter(s) your figures are referring to. If you mix annual and quarterly reporting, please be clear as to whether data refers to a whole year, or to the balance of the year not covered by a prior quarterly return.

Each of the three columns are intended for separate aircraft, not for three separate month's data. If you have only one aircraft, just provide the total figures for the quarter using one column (otherwise Paul will have to add them up himself).

Ab initio training (aero clubs and flying schools) belongs here.

For aircraft not used for hire or reward.



Aviation Safety Advisers

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

Safety Management Systems Seminar

The CAA and the AIA will be hosting a seminar on Safety Management Systems (SMS) in Queenstown 18–19 February 2010.

There will be presentations from leading industry participants and regulators, discussion on how to implement SMS in your organisation, and efficient ways to share data.

There will also be an opportunity for you to comment on what you believe to be an acceptable level of safety.

For more information see the "Safety Management Systems (SMS)" page on the CAA web site, www.caa.govt.nz, or the "Events" page on the AIA web site, www.aia.org.nz.

The new Rangiora and Canterbury CFZs.

Canterbury Congestion

The area to the west of the Christchurch Control Zone is one of the busiest in the country for general aviation activity.

There can be over 25 training aircraft using the area covered by the Canterbury and Rangiora Common Frequency Zones (CFZ), and the West Melton Mandatory Broadcast Zone (MBZ), at any given time during the week. Adding to that, traffic based at Forest Field and Rangiora Aerodromes, plus the numerous other unpublished aerodromes within the CFZ boundaries (each with their own traffic), makes for some very busy airspace.

The closure of Wigram Aerodrome earlier this year has meant that more aircraft have moved into the Rangiora area, compounding the radio congestion that has been building steadily over the years. To combat this, the old Canterbury CFZ has been split in two. A new Rangiora CFZ became effective 19 November 2009. The new frequency for Rangiora traffic is 120.2 MHz, and the northern boundary of the new Rangiora CFZ is significantly further north than the northern boundary of the old Canterbury CFZ was. The Rangiora CFZ also extends east to the coast, so traffic tracking south to Christchurch will be passing through the CFZ to get to the Christchurch Control Zone, unless they fly seaward of the coast. Make sure you have the latest Visual Navigation Chart, so that you know when you should be making calls on 120.2 MHz.

The frequency for the new Canterbury CFZ and the West Melton MBZ remains 119.2 MHz.

Itinerant pilots should know the nature of the hornet's nest they are flying through if they transit the area to the west of the Christchurch Control Zone. The majority of the traffic in the area will be students, or relatively inexperienced pilots. A constant lookout is essential. Not only will there be aircraft carrying out training manoeuvres, but you may also find yourself flying through the circuit of an unpublished aerodrome. There are more than ten in the area. One near Darfield is used regularly by a DC3. Also make sure you know where to change between 119.2 and 120.2 MHz. Always make sure you are on the right frequency, and if you hear someone on the wrong frequency – tell them.

If the thought of transiting thorough this area now feels more like running a gauntlet, an alternative option is to request controlled VFR through the CTR or CTA. Airways will accommodate this if traffic and workload permit. ■

Update on **Taupo**

An aeronautical study of the airspace risk at Taupo Aerodrome conducted by the CAA last year has now been published on the CAA web site. The review looked to identify services and airspace requirements to support safe and efficient aircraft operations at Taupo Aerodrome and in the surrounding airspace.

Some of the recommendations were:

- Development of a Taupo Airport Authority web site with information for itinerant pilots. This web site has been completed and is available at www.taupoairport.co.nz. The web site has a lot of good information for operating on or near Taupo. There is advice on the preferred joining procedures for each runway, with excellent photos of the approaches. In particular, the advice on the web site is to **not** join overhead.
- Change the contents of *AIP New Zealand* to ensure pilots have access to information on procedures, limitations, and airspace requirements. The *AIP* information is being reviewed and some content will be published on the Taupo Airport web site in the future.
- To extend the transponder mandatory MBZ downwards, taking into account non-transponder equipped aircraft without compromising ACAS effectiveness. This recommendation has been incorporated in the 19 November 2009 airspace amendments.
- To change the procedure in the event of a parachute cutaway. If there is a parachute cutaway a person on the ground will broadcast the cutaway and the direction the parachute is drifting.
- Publication of a GAP booklet for Taupo. This will not be required as the web site includes all relevant information.

Look out for the changes to Taupo airspace on the 19 November 2009 charts.

For a copy of the full report, including the recommendations and their status, see the Aerodromes page on the CAA web site, www.caa.govt.nz. ■

For accurate and up-to-date information on operating in and around Taupo Aerodrome, consult the Taupo Airport web site, www.taupoairport.co.nz.

STOP PRESS!

Changes to **Aircraft Certification**

As this issue of *Vector* was being finalised, changes to Part 21 *Certification of Products and Parts* were signed by the Minister of Transport, and will become effective 3 December 2009. The changes provide six sub-categories for Special Category Airworthiness Certificates: Experimental, Exhibition, Amateur-built, Primary, Light Sport Aircraft, and Limited (see May/June 2009 *Vector*). Special Category Experimental Aircraft have 12 months before they must comply with the new limitations in 91.105(e) for Experimental aircraft.

The CAA web site, www.caa.govt.nz, has a web page that will give information on making the transition to one of the new categories, and also information regarding new and imported aircraft – see the "Aircraft" page.

Flight Instructors' List

You can keep up to date by subscribing to the CAA Email Notification Service. Reminders are sent out about changes to rules and airspace, and the issue of airworthiness directives.

We've added a new list for Flight Instructors, so they can receive information on changes that are relevant to them, such as seminars, updates to the Flight Test Standards Guides, etc.

To subscribe to this notification service, go to the "Email Notification Service" page on the CAA web site, www.caa.govt.nz.

Photo: ©istockphoto.com/Yakobchuk

Gone No Address

This year has seen a steep increase in the number of aircraft owners who have either not kept us informed of their change of address, or who have failed to pay their Annual Registration and Participation Levy account.

We realise that times are tough this year, but the Annual Registration and Participation Levy is now overdue and if not paid, the Director of Civil Aviation can revoke the Certificates of Registration and Airworthiness for non-payment. If you do not have a current certificate for your aircraft in your name, then the Certificate of Registration may have expired or be invalid. You can now check a list of all non-payers on the CAA web site. See the Aircraft page.

The following is a list of aircraft registrations that do not have a current address with the CAA. Please contact us to update your details at info@caa.govt.nz.

ZK-BZH Piper PA-28-160
ZK-CXF Cessna 150H
ZK-RBR Air Command Commander Elite
ZK-RNS Rans S-6ES Coyote II
ZK-ROX SkyStar Kitfox VII
ZK-TII TEAM 1300 Z Max

Photos: ©istockphoto.com/spxChrome/DNY59

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).

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".

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***
23 Dec 2009	4 Jan 2010	11 Mar 2010
25 Jan 2010	1 Feb 2010	8 Apr 2010
22 Feb 2010	1 Mar 2010	6 May 2010

AV KIWI SAFETY SEMINARS

Mountain Flying 2010

CAA at SportAvex 2010, Tauranga

The CAA will be delivering three seminars at SportAvex 2010 at Waitangi weekend 5 and 6 February.

The first is the AvKiwi Safety Seminar on Mountain Flying presented by Jim Rankin. This safety seminar starts the season of AvKiwis that stretch from March through to June. Look out for an AvKiwi coming to a town near you. For more information as dates are confirmed, see the January/February issue of *Vector,* or the "Seminars and Courses" page on the CAA web site, www.caa.govt.nz.

Rex Kenny, Sport and Recreation Manager, will present a session on changes to the sport and recreation rules, and there will be plenty of time for questions and answers.

Claude Preitner, Senior Medical Officer, will give his informative and amusing presentation on the aging pilot. ■

Plain Language Met

In response to demand from the general aviation sector, plain language weather briefings will be available through the MetFlight GA web site, http://metflight.metra.co.nz.

The key driver behind this facility has been the Aviation Federation.

Aircraft Owners and Pilots Association representative, Don Ryder, said the new service was a tremendous leap forward for light aircraft safety in New Zealand.

"For our 5000 plus GA pilots, who predominantly fly locally, it is only a few times a year that they require a full Met briefing, and they can find the decoding difficult. Now they can get all of the information in a format they can instantly understand."

The MetService will provide a facility where the MetFlight weather briefing is translated (using a program developed by Ian Boag) and returned in plain language. ■

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-DIR Piper PA-23-250

Date and Time:	5-Sep-08 at 8:40
Location:	Palmerston North
POB:	3
Injuries:	0
Damage:	Minor
Nature of flight:	Transport Passenger A to B
Pilot Licence:	CPL (Aeroplane)
Age:	31 yrs
Flying Hours (Total):	1500
Flying Hours (on Type):	480
Last 90 Days:	180

During the cruise the pilot heard a clunk, felt a shake through the aircraft, and the gear-up light went out at the same time. The gear was recycled up and IAS increased, it was suspected that one of the landing gear doors had drooped.

On approach for Wellington, the pilot selected flap down, but there was no response, and the pilot immediately neutralised the flap lever, suspecting a hydraulic leak. When visual on approach the pilot tried using the hand pump, but this was totally slack, and the pilot requested a missed approach and hold.

After assessing fuel reserves and obtaining weather for Palmerston North, the pilot elected to divert in order to minimise traffic disruption at Wellington. At Palmerston North the pilot carried out a low approach and overshoot while emergency services viewed the gear position by spotlight. They confirmed three gears were extended, but the pilot had no green down-and-locked indication and could see that the nosewheel was not locked down.

The pilot made a flapless approach and in the flare feathered both props and positioned them horizontally to avoid ground contact. The nose leg folded rearward, and the aircraft slid to a stop with it retracted.

The aircraft was impounded at CAA's request in a hangar. Under CAA supervision the following week, the aircraft was jacked and hydraulic pressure applied to the landing gear system by use of the hand pump. Immediately an hydraulic leak was noted coming from the gland seal around the right hand MLG actuator piston shaft.

The actuator was removed and disassembled for defect analysis. The O-ring around the piston shaft had picked up and rolled on the shaft, causing the O-ring to break. The actuator seals were replaced, the actuator refitted to the aircraft and functional checks carried out.

The operator applied for a special flight permit from CAA, and the aircraft was flown back to base for repairs to the belly skin under the nose section. To help prevent a similar occurrence, the maintenance provider's maintenance procedures now incorporate a 5-year calendar inspection of the landing gear actuators.

CAA Occurrence Ref 08/3785

ZK-EAK Raytheon 1900D

Date and Time:	18-Jun-07 at 09:07
Location:	Woodbourne
POB:	17
Injuries:	0
Nature of flight:	Transport Passenger A to B

On Monday 18 June 2007 at 0812, ZK-EAK, a Raytheon 1900D, was on approach to land at Wellington when the landing gear failed to lower. The 2-pilot crew completed a missed approach and further attempted to lower the landing gear by both normal and emergency means. The landing gear remained retracted, so the crew elected to divert to Woodbourne where a wheels-up landing was made.

The aircraft sustained moderate damage consistent with a wheels-up landing. There was no injury to the crew or the 15 passengers. A fatigue crack in the hydraulic actuator for the right main landing gear allowed hydraulic fluid to escape, which prevented the crew lowering the gear by either the normal or emergency systems.

Safety issues identified included the need to improve the design and inspection of the hydraulic actuator and the serviceability of the hydraulic quantity low-level sensor. Until improved actuators were available, the inspections and limitations put in place by the operator should prevent a reoccurrence of the actuator failure. The United States Federal Aviation Administration, the airworthiness authority for the aircraft, in conjunction with the aircraft manufacturer, has alerted other operators of the Beechcraft 1900 to the actuator fault issue. Main sources of information: Abstract from TAIC Accident Report 07-006.

CAA Occurrence Ref 07/2151

ZK-WPO Cessna 172A

Date and Time:	7-Sep-08 at 12:45
Location:	Rangiwahia Airstrip
POB:	3
Injuries:	0
Damage:	Minor
Nature of flight:	Private Other
Pilot Licence:	PPL (Aeroplane)
Age:	54 yrs
Flying Hours (Total):	239
Flying Hours (on Type):	188
Last 90 Days:	1

During the takeoff run on the private airstrip, the pilot felt that the aircraft had stopped accelerating at about 45 kts. The takeoff was aborted but, due to a slight downhill slope and a slippery grass surface, the aircraft could not be stopped before it went through the end fence and stopped about six metres further on. The three occupants were not injured, and the aircraft received minor damage to the propeller, wheel spats, and one wing strut.

CAA Occurrence Ref 08/3781

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 150H

Carbon Monoxide Detector

Part Model:	Aero 152-A
Part Manufacturer:	CO Guardian
ATA Chapter:	2560

The aircraft was equipped with a CO Guardian Aero-152A Carbon Monoxide detector. During cruise flight the detector indicated 80PPM Carbon Monoxide when the amber warning light glowed and an audible alarm came on. The pilot made a PAN call and requested clearance into the control zone. No assistance was requested, however, and operations proceeded normally to a normal approach and landing. Investigation found that the Carbon Monoxide detector was faulty and giving spurious indications.

CAA Occurrence Ref 09/691

Cessna 206

Fuel Pressure Indication

Part Model:	206
Part Manufacturer:	Cessna
Part Number:	1200106-176
ATA Chapter:	7330
TTIS hours:	20.65

During flight, the pilot noticed a steady drop in fuel pressure. After switching on the fuel pump and changing tanks, the pressure continued to zero. The pilot immediately returned to land. Maintenance investigation found that the fuel flow gauge pressure line was broken at the firewall fitting. The pressure line was replaced with a flexible hose as per the latest issue of the Cessna IPC.

CAA Occurrence Ref 09/256

Cessna R172K

Fuel Injectors

ATA Chapter:	7320

Approximately 6 minutes after takeoff the engine suddenly started surging over a 2 minute period. The pilot initiated a turn back towards the aerodrome where a safe landing was carried out. Maintenance investigation found that two fuel injectors were blocked. The injectors were cleaned and the aircraft was returned to service with no subsequent problems.

CAA Occurrence Ref 09/1044

Diamond DA 42

Bulb

ATA Chapter:	3310

Tracking back to the VOR, an electrical burning smell and suspected smoke were noticed in the cockpit. A PAN call was made to ATC. The aircraft was IMC at the time and had to fly the full instrument approach before becoming visual at 800 feet. The aircraft landed safely with the Rescue Fire crew waiting on the apron. The overhead reading lights were removed and inspected. Nil problem found. However, a subsequent flight experienced a similar problem 6 days later. This time it was noted that the overhead light fitting had melted (last time it was switched off quickly and no damage occurred.) This was due to an incorrect bulb being fitted. The pilot side passenger light fitting was moved to the front as an initial fix, and new parts ordered. The passenger light fitting was labelled inoperable until the new parts arrived.

CAA Occurrence Ref 09/354

Piper PA-28-181

Artificial Horizon

ATA Chapter:	3421

While on an IFR training flight, a discrepancy was noted between the Directional Indicator and the Artificial Horizon. It was established that the Artificial Horizon was unreliable. The pilot declared an emergency and elected to maintain 5000 ft, found a break in the cloud, was able to descend out of IMC, and proceed to the destination VFR. The original AH fitted to the aircraft had been removed due to unservicability and was replaced by a serviceable unit from another aircraft. The replacement AH appears to be giving unreliable roll information. The original AH has now been refitted after repair.

CAA Occurrence Ref 09/78

Tecnam P2002-JF

Nose Wheel Fork

Part Model:	P2002 JF
Part Manufacturer:	Tecnam
Part Number:	92-8-120-1/2
ATA Chapter:	3220
TTIS hours:	707.5

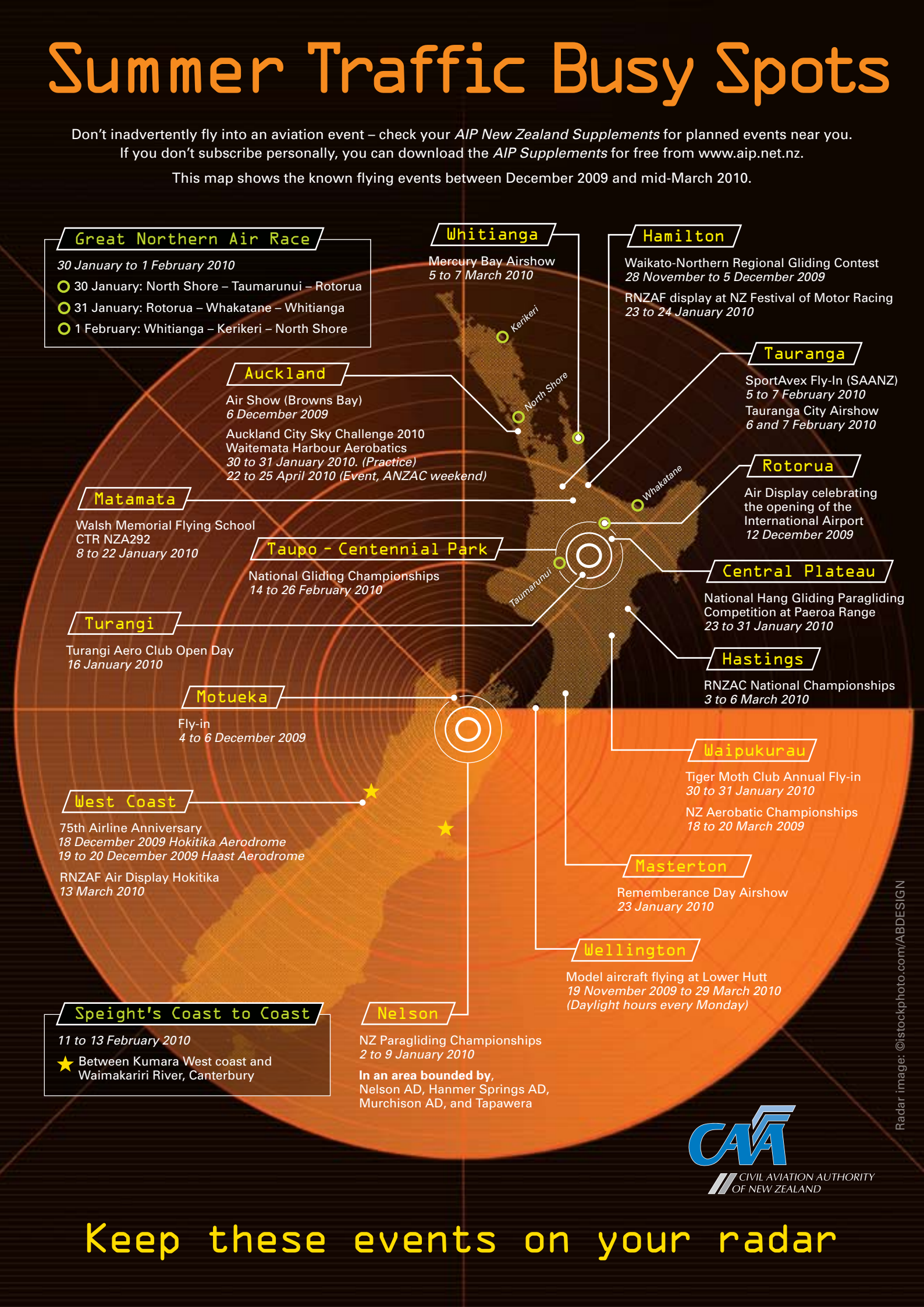
During crosswind circuit training on the grass runway, the nosewheel collapsed during the takeoff roll. The pilot raised the aircraft and aborted the takeoff, shutting down the engine before lowering the nose stopping the aircraft without further damage. Maintenance investigation found that one side of the nosewheel fork had failed. Fatigue cracking was evident at the failure surface. Probable cause of the failure is due to the light construction of the fork assembly combined with wear and tear from operation on rough grass surfaces.

CAA Occurrence Ref 09/572

Summer Traffic Busy Spots

Don't inadvertently fly into an aviation event – check your *AIP New Zealand Supplements* for planned events near you.
If you don't subscribe personally, you can download the *AIP Supplements* for free from www.aip.net.nz.

This map shows the known flying events between December 2009 and mid-March 2010.



Great Northern Air Race

30 January to 1 February 2010

- 30 January: North Shore – Taumarunui – Rotorua
- 31 January: Rotorua – Whakatane – Whitianga
- 1 February: Whitianga – Kerikeri – North Shore

Whitianga

Mercury Bay Airshow
5 to 7 March 2010

Hamilton

Waikato-Northern Regional Gliding Contest
28 November to 5 December 2009

RNZAF display at NZ Festival of Motor Racing
23 to 24 January 2010

Auckland

Air Show (Browns Bay)
6 December 2009

Auckland City Sky Challenge 2010
Waitemata Harbour Aerobatics
30 to 31 January 2010. (Practice)
22 to 25 April 2010 (Event, ANZAC weekend)

Tauranga

SportAvex Fly-In (SAANZ)
5 to 7 February 2010

Tauranga City Airshow
6 and 7 February 2010

Rotorua

Air Display celebrating the opening of the International Airport
12 December 2009

Matamata

Walsh Memorial Flying School
CTR NZA292
8 to 22 January 2010

Taupo - Centennial Park

National Gliding Championships
14 to 26 February 2010

Central Plateau

National Hang Gliding Paragliding Competition at Paeroa Range
23 to 31 January 2010

Turangi

Turangi Aero Club Open Day
16 January 2010

Hastings

RNZAC National Championships
3 to 6 March 2010

Motueka

Fly-in
4 to 6 December 2009

Waipukurau

Tiger Moth Club Annual Fly-in
30 to 31 January 2010

NZ Aerobatic Championships
18 to 20 March 2009

West Coast

75th Airline Anniversary
18 December 2009 Hokitika Aerodrome
19 to 20 December 2009 Haast Aerodrome

RNZAF Air Display Hokitika
13 March 2010

Masterton

Rememberance Day Airshow
23 January 2010

Wellington

Model aircraft flying at Lower Hutt
19 November 2009 to 29 March 2010
(Daylight hours every Monday)

Speight's Coast to Coast

11 to 13 February 2010

★ Between Kumara West coast and Waimakariri River, Canterbury

Nelson

NZ Paragliding Championships
2 to 9 January 2010

In an area bounded by,
Nelson AD, Hanmer Springs AD, Murchison AD, and Tapawera

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

Keep these events on your radar