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VECTOR

POINTING TO SAFER AVIATION

Short-Field Landings

Syndicate Installs Traffic Advisory System

Aerodrome Markings

Runway Incursions

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

VECTOR

In this issue...

Syndicate Installs Traffic Advisory System

An Auckland-based R44 syndicate has gone to the trouble and expense to install a traffic advisory system in their helicopter. They relate how they made the decision, and report on their first flight experiences with the device installed.

Short-Field Landings

A 'short-field landing' is an exercise in precision – used when landing on a runway shorter than that normally available but still sufficient for landing. It is not for a runway that is too short, or of unknown length. It is a normal operational procedure.

Aerodrome Markings

All aerodrome users should be as familiar with aerodrome ground markings as they are with highway traffic signs. In this article we look at standard aerodrome markings, and where to find information on more complex markings.

Runway Incursions

Major accidents involving ground collisions between aircraft, or aircraft taking off or landing on the wrong runway have occurred overseas. Good pre-flight preparation, vigilance, and clear and concise radio calls are some of the ways to reduce a runway incursion.

Cover: *Air Gisborne's Cessna 172M ZK-DXF participating in the 2007 RNZAC Nationals at New Plymouth.*

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New Zealand Government

Syndicate Installs Traffic Advisory System

By **Dave Saggs**

Thanks to Dave Saggs and the R44 syndicate for submitting this article. They have 'gone the extra mile' by having a traffic advisory system fitted to their helicopter, and we appreciate them sharing their experience with *Vector* readers.

The author, Dave Saggs, and ZK-HOX. The upper aerial and front lower aerials (see left) are used by the TAS600 to give best coverage and aircraft detection.

Have you ever looked out the windows of your aircraft and seen another aircraft flying closer to you than you are comfortable with and wished you had seen it earlier? Or perhaps given a position report and then immediately heard another aircraft giving the same position and maybe even a close altitude?

The theory is that it is a big sky. We are constrained, however, by various airspace limits and often want to fly to the same destinations. Classic examples of high traffic flows in the Auckland area are the transit lane off the East Coast Bays, and also around the Brookby area. And when the weather comes down we all head for the same small gaps.

> *Over the last 11 years there have been four mid-air collisions in New Zealand airspace resulting in 15 fatalities. In the same period there have been 11 'near miss' or serious loss of separation incidents involving air transport aircraft. In several incidents pilots spotted the conflicting aircraft, but generally in insufficient time to enable effective avoidance action to be taken, the aircraft missing each other by good fortune.*
>
> Quote from a CAA report, December 2001

With regard to the near misses, I believe that the CAA would be most likely be referring to events in controlled airspace where they would be reported more frequently. I expect there would be many more unreported near misses in general aviation. The US NTSB has 210 reports of midair collisions since 1990 and, although there is considerable light aircraft activity, it is also a huge country. That is one collision a month.

We all know that the other aircraft you are going to hit is the one that is not moving on your windscreen. And yet, as there is no relative motion, that is the hardest to see. There are real limitations on what you can detect visually – and whether you can detect it in time to take appropriate avoidance action.

All major airlines use a system called ACAS (Airborne Collision and Avoidance System), and pilots consider it to be one of the best safety advances to have occurred in the last few decades. The system uses signals from the aircraft's transponder to indicate its position to another aircraft. Similar technology, Traffic Advisory System (TAS), is available to light aircraft. The difference to ACAS is that it does not give Resolution Advisories, which are directions given to the pilot – either a pitch attitude, or rate of climb or descent, to avoid the collision.

Technical Background

There are two types of TAS systems available. One system only 'listens', and so picks up the response from an aircraft transponder triggered by a ground-based radar, or commercial aircraft's ACAS. This is relatively cheap, as low as US$500, and works okay in the US where there is extensive radar coverage. It would work in New Zealand in the areas with radar coverage.

The better system 'interrogates' other aircraft. It sends out a signal to trigger a response from the other aircraft's transponder, and therefore is more appropriate to the New Zealand environment. We chose the Avidyne TAS600 on price, and as it integrated with our Garmin 420 GPS display to provide full visual information.

Continued over...

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VFR flying is an 'eyes outside' operation, however, and so we saw the significant advantage of this system is that it gives an aural warning through our headsets. For example, "Traffic, three o'clock high, one mile".

The TAS600 will track 50 targets and display 9. It has a range of 7 NM. The display can be zoomed in to 2 NM or 1 NM to get a better indication of where the threat is. The volume is selectable in the setup menu, as are the triggers for the aural warning. We have these set to warn us of an aircraft approaching within 1 NM and 500 feet altitude.

The information displays on the Garmin Map page in a tiny threat window, and as text indicating range and altitude. If we had a heading input, we would get a full overlay of the threats on the Map page. However, in airspace we are familiar with, or when joining a circuit, we mostly bring up the Threats page, which gives a full display of the other aircraft in the vicinity.

Not a sight you ever want to see. This is another aircraft a very short distance away, 200 feet above, but descending.

Installation

South Pacific Avionics and Heliflite Pacific at Ardmore installed the box, wiring, two aerials, one above and one below the cockpit, and interface with the Garmin 420. We have an instant mute button on the cyclic that mutes an individual target, and a master mute on our intercom system so we can turn all the aural warnings off when in the circuit. If the instant mute button is pressed twice rapidly it will bring up all current aural warnings, even if you are sitting on the ground.

The installed equipment came to about $25,000. Not cheap, but when shared among our syndicate members it was agreed that we would like to have the protection that this system would add to our flying. Hopefully, as happens with most electronic equipment, the price will come down.

Just another busy day at Ardmore. The two aircraft on the left showing +24 (2400 feet above) and +29 are departing from Runway 05 at Auckland International Airport.

The Map page, showing a Traffic Advisory (TA), which is traffic within 500 feet altitude and not diverging. The Proximity Advisory (PA) is traffic within 500 feet altitude but not as high a risk as a TA. On the bottom right is a thumbnail of the traffic's position.

Does it Work?

The system will display threats after a short warm-up period on the ground. It changes to a flight mode after climbing through 400 feet from your departure elevation, and will then give aural warnings. It always gives accurate distances to the threat, and accurate relative altitudes and whether the other aircraft is climbing or descending. This is useful if you cannot readily see the aircraft, so you can climb or descend to ensure separation. Our system does not have a heading input, so the relative position is taken from the GPS track. This works well at speed, and in the cruise, but the GPS track is slow to update at lower speeds, and in the circuit the relative direction does not always display correctly.

The TAS 600 will always be a back-up to the 'mark one eyeball', but I have found on numerous occasions that it has given me an early warning of where to look, and indeed that traffic was there sometimes when I was not expecting it.

To give an example, I was approaching Whitford to land on some farm land. I was crossing the busy transit area that runs from Ardmore to the North Shore. The TAS 600 was showing a target approaching at my altitude and two miles away so I reported at Whitford, and waited. I still couldn't see the aircraft, so reported again and started to descend. Still no report so, in frustration I asked if anyone else was at Whitford. The other aircraft responded that he had the helicopter in sight and shortly after flew directly overhead. I have found a number of times over Auckland City when the TAS 600 shows that other aircraft are there, that they seem happy to hear where I am, but don't return the favour of letting me know where they are by reporting their position, even though they may be very close.

Another incident occurred over the southern end of the Firth of Thames when I was cutting the corner at about 3000 feet. Another aircraft was doing the same thing but going in the opposite direction. I don't think either of us expected another aircraft to be there, and the first we knew was through the aural warning. There were three pilots in our R44 scanning to try to find the other aircraft. It was painted white, and on a white sky it was very hard to see until surprisingly close.

Please Turn Your Transponders ON!

The main issue is that currently a lot of New Zealand airspace does not require pilots to turn their transponders on. Having operated in and out of Auckland in an Airbus, I was pleased to see always three to five targets in the Ardmore area and a number over the city and North Shore. I have found that most pilots turn their transponders on around the Auckland area, and also in busy airspace. For example, around Queenstown and the Franz Josef Glacier.

Please turn your transponder to at least ON (mode A), and preferably to ALT (mode C). In both cases you will then be protected from bumping into our red R44, ZK-HOX, the Police and Westpac helicopters, and other ACAS equipped aircraft. ATC may also have a better idea of where you went down, in the event of an engine failure.

Overall, I feel that the TAS600 offers significant additional protection and advice of the location of other aircraft in the vicinity. It is easy to use, and the aural warning works very well. It is surprising how much light aircraft traffic there is out there. ■

Dangers of Static

The September/October 2005 issue of *Vector* featured an article, *Dangers of Static*, on a fuel explosion caused by static electricity. The consequences were severe, with a seriously-injured engineer, the loss of an aircraft, hangar damage, and estimated costs of over half a million dollars. Prominent in the article was the statement:

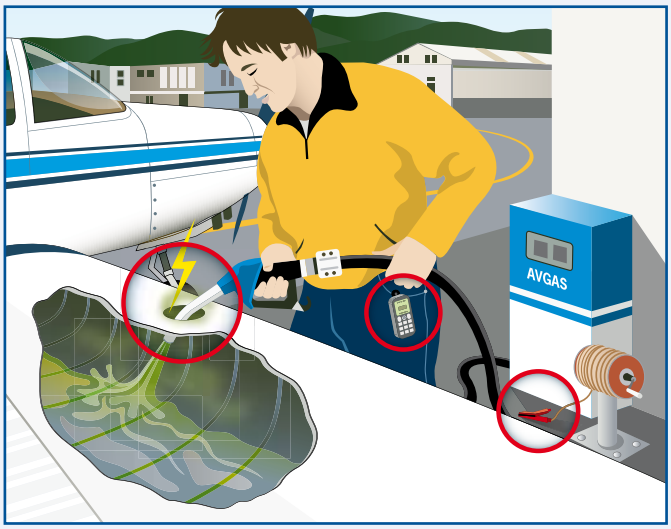
The possibility of a fire or explosion created by static electricity is forever present – no matter how remote it may seem.

Just a few weeks ago, a helicopter was being refuelled with avgas from a jerrycan described as a proper anti-static can with a non-splash filler. The pilot swung the can up to the tank filler hole, and as it got close, a static spark ignited the fuel vapour. Only prompt action with a fire extinguisher saved the aircraft and personnel from damage or injury.

The pilot was wearing cotton/polyester overalls and rubber-soled boots. He had not touched the helicopter to equalise any static charge before bringing the fuel can up to the filler hole.

The operator promptly reported the incident to the CAA, and was particularly concerned that a reminder on the dangers of static should be circulated as soon as possible to other operators.

The original *Vector* article is now posted as a stand-alone item on the CAA web site, under "Publications". If the dangers of static are not part of your risk management strategy or your health and safety plan, now would be a good time to rectify the situation.



Key points from the previous article:

- Refuel and defuel outdoors.
- Ensure electrical bonding is in place prior to removing any fuel caps.
- Use only approved containers.
- Use only approved filters.
- When in doubt, consult your fuel supplier.

And we can now add:

- Always have a fire extinguisher handy.

Short-Field Landings

A 'short-field landing' is an exercise in precision – it is a landing on a runway shorter than that normally available for the conditions but still sufficient for landing. It is not for a runway that is too short, or where the runway length is unknown. It is a normal operational procedure.

Landing on a runway that is too short, or one where the length is unknown, may be the only available option in a precautionary landing situation, but this is an emergency procedure. The approach technique is the same, even if the end of the landing roll may be other than normal.

The considerations discussed in this article also apply to airstrips and farm paddocks, although it is not intended to cover these to any degree – strip operation is a specialised area of training in itself.

Will We Fit?

Group Rating Number

The group rating number can be used to establish performance compliance for aeroplanes with a MCTOW of 2270 kg or less, for private operations only. Each runway for which details are published in *AIP New Zealand* is allocated a performance group rating number, and up to 1 April 1997, when Civil Aviation Safety Order (CASO) 4 was revoked, light aeroplanes were allocated a group rating number (1 to 8) by means of a flight manual supplement. If the aircraft flight manual still contains reference to the group rating number, then this system may still be used. Group rating numbers are no longer allocated to aircraft when they are placed on the register.

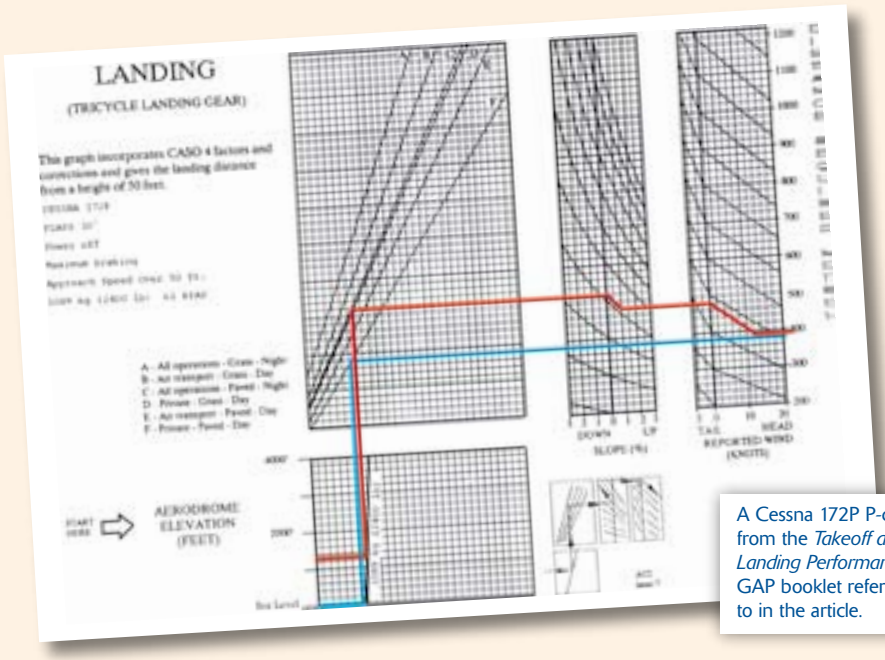
A runway with a group rating of 6, for example, can accommodate aircraft with a group rating number of 1 to 6. If you were flying a group 6 aeroplane onto a group 6 runway, the system does have some safety factors built in, but if there is any doubt, another method should be used.

Note that some runways have different group rating numbers for the takeoff and landing cases, and may also differ in the reciprocal direction, as dictated by slope or by obstacle clearance requirements.

P-Charts

These charts formed part of aeroplane flight manuals during the currency of CASO 4, but in most cases have been retained "for information only". They are no longer issued as a flight manual supplement. Their use to determine aircraft performance is still perfectly acceptable, however, and is more precise than the group rating system. You may even find that your group 6 aeroplane will be able to use a group 5 runway under certain conditions. P-charts apply various factors, including density altitude (for the takeoff case), type of operation, runway surface and slope, and wind to determine required takeoff and landing distances for a particular set of conditions.

If a set of P-charts is not already available for your aircraft, *Advisory Circular* 119-3 *Air Operator Certification – Part 135 Operations* contains a section (Appendix C) on how to develop a set. Performance data from the aircraft flight manual is transposed onto the charts to give the starting points for applying the various factors. For the landing case, use the flight manual figures for the distance required from a threshold height of 50 feet, not just the ground roll distance. Some manuals will quote this distance "over a 50-foot obstacle" – this is misleading, as the 50 feet is a theoretical screen height which is part of the certification process.



A Cessna 172P P-chart from the *Takeoff and Landing Performance* GAP booklet referred to in the article.

Once a chart has been created, it is a quick and convenient method of establishing runway length requirements.

Flight Manual Data

The flight manual data may also be used, with appropriate corrections (see *Advisory Circular* 91-3 *Aeroplane performance under Part 91*).

The flight manual figures must be treated with caution. They are the best figures that the manufacturer could obtain, and to quote from a Cessna flight manual,

> The above performance figures are based on the indicated weights, standard atmospheric conditions, level, hard-surfaced dry runways and no wind. They are calculated values derived from flight tests conducted by The Cessna Aircraft Company under carefully documented conditions and will vary with individual airplanes and numerous factors affecting flight performance.

In short, these figures have been established by experts with new aircraft in ideal conditions. The average GA pilot will be hard-pressed to achieve the same results.

The landing distance figures are obtained with the aircraft at 50 feet over the threshold, at an airspeed of 1.3 times the stalling speed in the landing configuration. For the example used in the GAP booklet *Takeoff and Landing Performance*, a Cessna 172P, this is 61 knots indicated. Any excess height or speed at the threshold will increase the landing distance. Note also that the flight manual figures are predicated on maximum braking.

The basic flight manual figures need to be corrected for not only surface type, slope and wind, but also the type of operation. The P-charts have these factors built in, but it will be readily seen that air transport operations require more landing distance than private operations – in other words, a greater safety factor is incorporated. When using a 'private operations' landing distance that is only slightly less than the distance available, be very careful – test-pilot accuracy will be required. Is your standard of flying equal to the task? How current are you? If you have any doubts, abandon the attempt, the earlier the better.

Beware particularly of landings on short wet grass – braking action will be minimal to non-existent, and a considerable extra length needs to be allowed for landing. Fresh clover reputedly has similar properties without having to be wet. The UK CAA's *SafetySense Leaflet 7C* quotes a factor of 1.6 for short wet grass (ie, multiply the original calculated distance by 1.6). Even for a paved runway, Part 135 operations are required to allow 115 percent of the distance required for landing on a dry runway – and note also that the dry runway distance cannot exceed 85 percent of the available length.

Doing It

Having determined that you can land safely on a particular runway or strip, you need to set the aeroplane up in the correct configuration, at the correct speed and height, in order to achieve the landing in the distance available.

- On the downwind leg, confirm the conditions for the approach and the threshold speed, and choose an aim point.
- In gusting wind conditions, add half the gust range to the original target threshold speed – ie, if the wind is 15 to 25 knots, add half the difference, five knots. Just make sure that you have judged the wind direction correctly, and reassess this throughout the approach.
- Adjust the base turn point so that some power will be used throughout the entire approach – this will enhance elevator effectiveness, particularly during the flare.
- Monitor the approach path with respect to the aiming point, adjusting power as required to control the rate and angle of descent.
- Select full flap once established on final, and progressively reduce airspeed to achieve the target threshold speed (V_{TT}) by about 200 feet agl.
- If the aircraft is not properly configured by 200 feet agl, on centre-line, on glideslope, aim point identified and airspeed correct – or the landing is not assured for any reason – go around.
- Carry some power right into the flare, and carry out the landing in one phase – the round-out and hold-off are combined to reduce the rate of descent to zero as the main wheels touch the ground and the throttle is closed.
- You should have a previously identified point on or beside the runway at which you will go around if the wheels are not on the ground. This is extremely important where there is no surplus runway length available. Call the point a 'decision point' if you will, even though the decision has already been made. At that point, if you aren't on the ground, there is no decision – you must go around.
- Lower the nosewheel, then apply braking as required (don't lock the wheels as this will reduce braking effectiveness), holding up-elevator to reduce weight on the nosewheel.
- Raise flap on completion of the landing roll. ■

Further Reading:

Civil Aviation Rules 91.201, 135.211, 135.223, 135.25.

Advisory Circulars AC91-3, AC119-3, AC139-7.

GAP Booklets *Takeoff and Landing Performance* and *Flight Instructor's Guide*.

The end result of a well planned and executed landing.

Don't forget to amend SARTIME or terminate your flight plan!

Aerodrome Markings

All aerodrome users should be as familiar with aerodrome ground markings as they are with highway traffic signs – not knowing what they represent could lead to a dangerous situation.

For the general aviation pilot with little experience in operating from busy aerodromes, negotiating the concrete and asphalt maze of taxiways, turnoffs, holding points, apron areas, etc, can be rather bewildering. Taking a wrong turn at the wrong time may not only be very embarrassing, but also potentially hazardous. It is very important that all pilots using such aerodromes be thoroughly familiar with standard ground markings, as well as the layout of the manoeuvring area, and ground movement procedures.

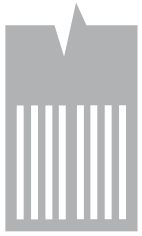
Ground movement charts for the major aerodromes and a number of provincial aerodromes are provided in *AIP New Zealand*. Pilots need to be able to follow ground movement charts while taxiing an aircraft.

Large aerodromes with interconnecting taxiways are designed for speedy, efficient movement and safe traffic flow on the ground. To avoid becoming the cause of a bottleneck in the flow, pilots should familiarise themselves with the meaning of aerodrome markings before entering an aerodrome area.

Contained in this article are some of the main aerodrome markings that you might expect to see while operating in New Zealand. We haven't included every possible marking, but for those who would like further information, a simple description and explanation can be found in *AIP New Zealand*. Details of New Zealand standards for runway, taxiway and apron markings can be found in *Advisory Circular* 139-6, Appendices 1 to 3. Although this information is designed for aerodrome operators, it also provides useful illustrations for pilots.

Runway Markings

All runway surface markings are painted white, sometimes edged with black (on concrete runways) to provide better definition. At the intersection of two paved runways, markings on the primary runway only are displayed.



Threshold Markings

Threshold markings are provided on all paved runways. They are commonly referred to as piano keys. They are a series of parallel, longitudinal, stripes (30 metres in length) across the width of the runway, commencing at a point 6 metres from the runway end.

Permanently Displaced Threshold

Temporarily Displaced Threshold

Displaced Landing Threshold

When necessary, the landing threshold will be displaced to a point along the runway where the approach profile will allow an aircraft to clear some particular obstacle. The threshold may be temporarily or permanently displaced. If the obstacle will eventually be removed, then a temporarily displaced threshold is marked either by wing bars, cones, or marker boards placed outside the runway edge. If the obstacle cannot be removed, a permanently displaced threshold is marked by a transverse stripe 6 metres before the new threshold marking. Arrows between the paved runway end and the transverse stripe are located at a fixed distance back from the threshold stripes.

Landing aircraft should not touch down before the displaced landing threshold and should be flown across the threshold markings at approximately 50 feet agl.

It must be emphasised that a displaced landing threshold is not a displaced takeoff threshold. It has nothing to do with the point for commencing the takeoff roll. Indeed, failure to use the full takeoff distance available could result in the aircraft having an inadequate takeoff distance available, with reduction of obstacle clearance in the climb.

Centreline Markings

Centreline markings are provided on each paved runway, commencing from the runway designation marking. The centreline consists of a series of uniformly spaced lines and gaps along the centre of the runway throughout its length.

Pilots should familiarise themselves with the meaning of aerodrome markings before entering an aerodrome.

Runway Designation

The runway designation is located just beyond the threshold marking of each paved runway. It consists of the first two digits of a magnetic bearing relating to the runway centreline. For example, if the runway centreline is 286 degrees magnetic, the runway designation will be Runway 29 – the nearest first-two digits rounded.

Aiming Point Markers

Aiming point markers are two rectangular stripes either side of the runway centreline that are aligned to the PAPI to indicate the desired touchdown location in accordance with the visual aid provided. These have replaced fixed distance markers at some aerodromes. They indicate where the aircraft should touch down.

Fixed Distance Markers

Fixed distance markings consist of a rectangular block on each side of the runway centreline, 300 metres from the threshold. Each rectangular block is composed of a series of thin longitudinal stripes. This is where you should aim to touch down. These markings work on the assumption that you pass over the runway threshold at a height of 50 feet.

Touchdown Zone Marking

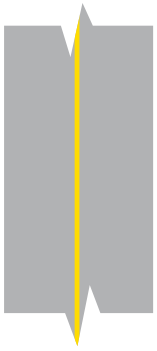
Touchdown zone markings are provided on runways that have instrument approaches, and consist of several pairs of rectangular blocks at 150-metre intervals from the threshold. They provide reference points for a pilot to assess their progress towards the fixed distance markers.

Touchdown Zone Limit Marking

Triangular touchdown zone limit markers are provided at some aerodromes as 'go-around points' for specific types of heavy aircraft that are runway restricted. The marking consists of a series of transverse stripes in a right angle pattern located at the runway edges. They are applicable only to those specific aircraft types. An example would be for a 747SP using an aerodrome such as Wellington.

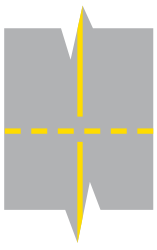
Taxiway and Apron Markings

Taxiway and apron markings are of a conspicuous colour (yellow) that contrasts with the colour used for runway markings – they may also be edged in black to provide better definition.



Taxiway Centreline Marking

A taxiway centreline marking is a continuous line. On a taxiway curve, the centreline marking will continue from the straight portion(s) of the taxiway at a constant distance from the outside edge of the curve. It is important that taxiway lines are followed when manoeuvring around the aerodrome to ensure adequate wing and wheel clearance in the case of large aircraft.



Intermediate Holding Position Marking

An intermediate holding position marking marks a holding position that has been established to protect a priority route. These markings consist of a single broken line.

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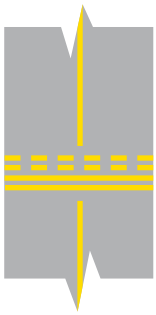
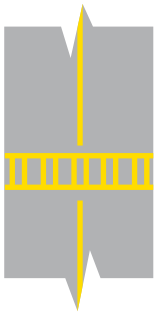
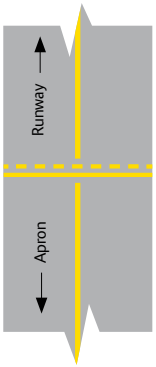
Runway Holding Position Marking



Pattern 'A' runway holding position marking is the last holding position prior to entering a runway. These markings consist of transverse lines across the width of the taxiway. Note that the line nearest the runway is broken and the one on the taxiway side is solid.



Pattern 'B' runway holding position marking is used to identify a holding point further away from a runway than a pattern 'A' runway holding position marking. A pattern 'B' runway holding position marking has two lines across the runway that are intersected at 90 degrees by small lines. It looks similar to a ladder across the taxiway.



In some domestic aerodromes in New Zealand the holding position marking may still be a single line with a dashed line closest to the runway.

Aircraft should not proceed beyond a taxiway holding position in the direction of the runway until the pilot is confident that the runway and approach are clear or, for a controlled aerodrome, a clearance has been issued by air traffic control.

Wellington International Airport, looking southwest.

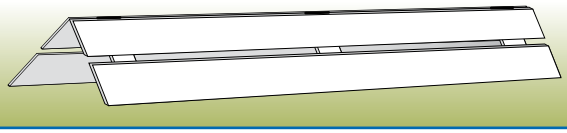
Closed Taxiway/Runway Marking

Closed Marking

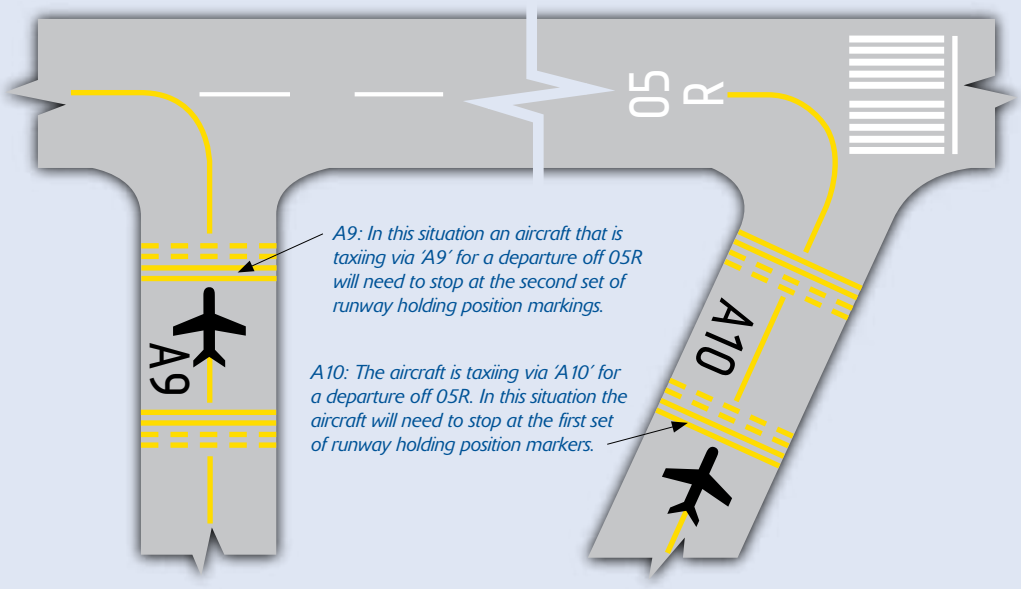
If a runway or taxiway (or a portion of either) is closed, white crosses near the ends of the closed portion will be painted, or will be formed by white marker boards.

Marker Boards or Cones

Marker boards or cones displayed on an aerodrome indicate the safe limits of aircraft movement. They comprise distinctive rectangular boards or pointed cones, coloured white, red, yellow or orange, and they are displayed on the boundaries of the areas concerned.



In situations where an aerodrome has two parallel runways, such as Auckland, pilots need to be aware of which runway holding position markings to stop at. Remember that you need to stop the aircraft short of the series of the lines where the closest to you is solid, and the furthest away is broken.



In both situations it is absolutely imperative that the pilots check to ensure the runway is clear before entering the runway even if an ATC clearance to line up has been issued.

Runway Incursions

A runway incursion is defined by the International Civil Aviation Organization (ICAO) as, "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft".

Major accidents involving ground collisions between aircraft, or aircraft taking off or landing on the wrong runway, have occurred overseas. Poor communications and lack of Crew Resource Management caused the collision of two Boeing 747s at Tenerife Airport in the Canary Islands, resulting in the largest loss of life in aviation history – 583 people. A collision between an MD-80 and a Cessna in Milan killed 188 people.

How can such accidents occur with modern aircraft, equipped with state-of-the-art radios, anti-collision devices, and manned by highly trained airline crews?

How can we prevent such accidents from occurring in New Zealand?

If pilots are vigilant and prepared, these types of accidents can be prevented.

Some of the causal factors that may lead to a runway incursion are: communications, airport knowledge, cockpit procedures for maintaining orientation.

Communications

Good communication between pilots and Air Traffic Services is critical to airport surface operations, especially during low visibility operations. All clearances must be fully understood, and if any crew member questions the clearance, it should be verified.

Make sure your read-backs are verbatim when they are required. By reading back a clearance you are confirming that you have heard, understood, and will comply with it. Extra attention is required when other aircraft with similar callsigns are on the same frequency.

Blocked radio transmissions adversely affect controller-pilot communications and pose a serious risk in relation to surface incidents. Blocked, or 'stepped-on', radio transmissions occur when one pilot attempts to transmit on a frequency that is already in use, either by another pilot, or air traffic control. When this happens, no one can hear either of the transmissions. Usually, neither of the two parties attempting to transmit simultaneously knows that their transmission was not heard, nor do they know that they missed hearing someone else's transmission. Third parties in the area hear a distinctive squeal, so they are aware that blocked transmissions have occurred, but they do not know the content of those transmissions. There are air traffic control procedures designed to mitigate the effects of blocked transmissions, but they are not failsafe. New anti-blocking radio technology is currently being developed to prevent radios from transmitting on the same frequency at the same time.

Wreckage from a collision between an MD-80 and a Cessna, in Milan.

For effective communications, clear and concise radio calls are essential.

Airport Knowledge

Most crews know every detail of their home airport, but flying into a foreign airport can pose many challenges. One crew member should always be following the aircraft progress with the airport diagram. In an unfamiliar environment it can be helpful to tell the controller that you are new to the airport, and ask for your taxiing to be monitored.

Cockpit Procedures for Maintaining Orientation

Pilots should maintain a 'sterile cockpit' during all taxi operations. There is no place for non-essential chatter while maintaining vigilance during the taxi. As a general rule, one pilot must always be looking outside the cockpit to scan for other traffic and to prevent incursions.

New technologies are helping to reduce the potential for runway incursion. Moving map displays are being trialled by some airlines in New Zealand to improve pilots' situational awareness on the airport surface. With an electronic moving map display, the pilot can see exactly where they are on the airport surface at all times. Each runway and taxiway is identified by name on the moving map. The electronic moving map depicts the cleared taxi route, as well as real-time information about the aircraft's position, other airport traffic, and hold short positions.

Summary

To reduce the risk of runway incursions, pilots should:

- Write down complex taxi instructions,
- Study airport diagrams before taxiing,
- Maintain a sterile cockpit,
- Monitor ATC instructions to other aircraft,
- Look both ways before entering and exiting active runways, and
- Always clarify and read back any confusing taxi clearances given by ATC.

The best preventions for runway incursions are good pre-flight preparation, communications, and vigilance. If you are in any doubt, ask. ■

Aviation Quiz

Test yourself on these aviation general knowledge questions, some of which were used in the 2007 Instructor Seminars.

1. If you haven't met the BFR requirements for the past 5 years, you must pass:
   A) Air law exam and BFR
   B) Air law exam and issue flight test
   C) Issue flight test
   D) All written exams and BFR

2. When flying below a ridge line the usable horizon is:
   A) Where the sky meets the sea
   B) An imaginary line representing the horizon
   C) The ridge line
   D) The valley floor

3. The Group Rating System assumes for takeoff that you will use:
   A) Max performance takeoff
   B) Into-wind runway
   C) A, B and D
   D) Full length

4. The takeoff distance available (TODA) includes the:
   A) Stopway
   B) Clearway
   C) Runway end safety area
   D) Taxiway

5. Max Manoeuvring Speed (V_A) is the maximum airspeed at which:
   A) Full and abrupt control movements may be used
   B) Turbulence should be penetrated
   C) A and B apply
   D) A crosswind landing can be executed

6. When may an ELT serviceability test be conducted?
   A) When airborne for best coverage
   B) In a shielded area during the 5 minutes past the hour
   C) In a shielded area with ATS approval
   D) In a shielded area during the 5 minutes before the hour

7. The demonstrated crosswind component of an aircraft is found in which section of the flight manual?
   A) Limitations
   B) Normal operations
   C) Emergency procedures
   D) The pilot handling notes

8. Class G Airspace, 1500 ft agl; what are the minimum VMC requirements for VFR?
   A) Vis 5 km; Clear of cloud and in sight of ground or water
   B) Vis 8 km; Clear of cloud and in sight of ground or water
   C) Vis 8 km; 1000 ft vertically and 2 km horizontally
   D) Vis 5 km; 1000 ft vertically and 2 km horizontally

9. What should immediately follow the words "MAYDAY, MAYDAY, MAYDAY"?
   A) Aircraft callsign
   B) Nature of distress
   C) Name of the station being addressed
   D) Present position, level and heading

10. $L = C_L \frac{1}{2}\rho V^2 S$ where S is:
    A) Speed
    B) Plan area
    C) Surface area
    D) Size

11. In an emergency the first priority is to:
    A) Troubleshoot the problem
    B) Make a MAYDAY call
    C) Fly the aircraft
    D) Choose a landing site

12. An English language proficiency assessment will be mandatory for licence issue from:
    A) August 2007
    B) December 2007
    C) March 2008
    D) Not mandatory but optional

13. The transponder code to be selected in the event of communications failure is:
    A) 7500
    B) 7600
    C) 7700
    D) 2200

14. The best flight path near terrain affected by wind can be readily predicted in conditions of:
    A) Less than 25 kts
    B) Less than 15 kts
    C) Greater than 15 kts
    D) Greater than 25 kts

15. When approaching an uncontrolled aerodrome below 3000 ft agl you should broadcast your intentions:
    A) Within 10 NM of the aerodrome
    B) Only if intending to land
    C) If other traffic is about
    D) Between 5 and 10 NM from the aerodrome

16. The takeoff distance data to be used for a Cessna 172 operating at night is:
    A) 1:20
    B) 1:30
    C) 1:40
    D) 1:50

17. During a PPL BFR, which manoeuvres are not compulsory?
    A) Crosswind takeoff
    B) All manoeuvres are compulsory
    C) Personal preparation
    D) Flight orientation

18. In a steady climb, lift is
    A) Increased
    B) Decreased
    C) Unchanged
    D) The same as straight and level

19. A Fit and Proper Person questionnaire is required to be completed when applying for:
    A) A prime rating
    B) An aircraft type rating
    C) A licence or prime rating
    D) A licence only

20. In normal (domestic) circumstances, you are required to complete logbook entries within:
    A) 7 days
    B) 14 days
    C) 24 hours
    D) 48 hours

Answers on page 21

406 Beacon Rules Signed

The Civil Aviation Rule amendments relating to the 406 MHz ELTs are effective from 22 November 2007, and are available on the CAA web site. Part 91 has been amended to require 406 MHz ELTs to be fitted to New Zealand aircraft by 1 July 2008, with consequential amendments to Parts 1, 43, 121 and 129. There are few exceptions to the rule requirements, and apart from ferry flights for beacon installation or maintenance, these are manned free balloons, and aircraft (with no more that two seats) operating within 10 NM of the departure aerodrome. Even gliders and microlight aircraft will be required to carry at least a 406 MHz personal locator beacon (PLB).

Important points to note are:

- These beacons, when activated, will still transmit a continuous 0.1-watt signal on 121.5 MHz, to alert other aircraft in the vicinity, and more importantly, to enable homing with VHF direction-finding equipment. In this respect, they do not differ from the older ELTs, so do not remove your homing gear in the belief that it will be superfluous.
- From 1 February 2009, 121.5/243 MHz signals will no longer be monitored and processed by the COSPAS-SARSAT satellites. They will receive and process only 406 MHz signals.
- The 406 MHz signal is transmitted in a very short burst every 50 seconds, at a strength of five watts. The transmission contains elements that positively identify the aircraft and country of registration, and this information is held by the Rescue Coordination Centre New Zealand (RCCNZ) so they know who to contact. Additionally, the aircraft's position is established instantly to within a 3-km radius, and if a GNSS interface is fitted, to the current GNSS accuracy.
- Once installed, the beacon must be registered with RCCNZ. For registration details, see the Maritime New Zealand web site: www.maritimenz.govt.nz, or www.beacons.org.nz.

Note that if any details on the initial registration change, or if the aircraft ownership changes, the registration details must be updated. Registration and updating is a free service.

- If you are in a MAYDAY situation, the beacon can be activated by the remote switch on the instrument panel. Add this item to your emergency checklist, just before or after the selection of '7700' on the transponder. In the event that the situation is recovered and you are able to fly away, leave the beacon ON – this way RCCNZ will be able to see that you are still airborne, and will not take SAR action based on a momentary signal. Of course, you will need to contact them as soon as possible to report what happened, and once you have done so, reset the ELT (reset instructions should appear on the panel-mounted switch).
- Fitting a 406 beacon should be a 'from scratch' process, even if the aircraft has previously been operating with a 121.5 beacon – avoid using existing wiring or antennas, as these may be incompatible with the installation.
- A tip when fitting a beacon that is not yet registered – notify RCCNZ beforehand, with the beacon serial number, and if it is accidentally activated during installation, RCCNZ will be able to contact the maintenance organisation.

Updated Advisory Circulars 43-11 *Emergency locator transmitters and* 43-14 *Avionics, installations- acceptable technical data, Appendix 2* contain guidance material on beacon performance, installation, antenna considerations and maintenance requirements. These ACs are, or will be very soon, available on the CAA web site.

Accidental Activation

If you set off your beacon accidentally, reset it immediately, and let RCCNZ know without delay by telephoning 0–4–577 8030 (24-hour number). There is no penalty for this – RCCNZ will thank you for your call. ■

Installation, Maintenance, and Certifying of ELTs

Currently, rule 43.51(a)(1) requires a person performing, or certifying for release-to-service, maintenance on an aircraft or component to hold a current Part 66 maintenance engineer licence in the appropriate category and with an appropriate rating.

Exemption 8/EXE/14 recognises that the rule requirements are inappropriate in the case of ELTs, and permits installation and maintenance of ELTs, and releasing to service by:

- any person holding a Part 66 aircraft maintenance engineer licence in the aeroplane or rotorcraft categories, if rated on the applicable aircraft type; and
- any person holding a Part 66 aircraft maintenance engineer licence in the electrical, instrument or radio categories,

provided that:

- the person is familiar with the ELT equipment; and
- in the case of the person holding an aircraft maintenance engineer licence in the aeroplane or rotorcraft categories, the person is familiar with the aircraft and appropriately rated on the aircraft type; and
- in the case of the person holding an aircraft maintenance engineer licence in the electrical, instrument or radio categories, the person holds a rating appropriate to the licence category.

Fly Neighbourly

You are focused on running an aviation business, or having fun in the air. It is easy to forget the impact your activities are having on people on the ground. A little consideration for your neighbours and people on the ground will most likely benefit your flying activities, but also enhance the reputation of aviation generally.

Minimum Height Limitations

Extracts from rule 91.311(a) *Minimum heights for VFR flights* state that you must not operate your aircraft under VFR:

- at a height less than that required to execute an emergency landing in the event of an engine failure; or
- over any congested area at a height of less than 1000 feet above the surface or any obstacle; or
- over any other area, at a height of less than 500 feet above the surface.

Exclusions apply, for example taking off or landing, or operating an aircraft within a low flying zone (LFZ) in accordance with rule 91.131 *Low flying zones*.

The primary reason for this is safety. A reasonable height will give you time to deal with an engine failure or other malfunction. In the case of a power loss, there will be only limited time to recognise the situation, carry out trouble checks, and prepare for a forced landing. These height minimums are intended to give you time and gliding range, although you can always set greater personal minimums to further reduce the risks.

A further reason is noise. Generally, an aircraft flying overhead at the legal height will not raise too many concerns. There can be complaints when an observer thinks an aircraft is too low. An aircraft operating repeatedly over the same spot at minimum height can soon become a nuisance. Aircraft noise can also disturb animals.

The CAA's area of responsibility is restricted to aviation safety and security. As noise is not generally considered a safety issue, the CAA does not have authority to assist with the problem. If you are being bothered by aircraft noise, contact your local regional council.

LFZs

Noise issues are even more sensitive in LFZs – especially those where there has been considerable land use change over the years. Awareness of the needs of landowners under or near an LFZ is critical. With the rights to use an LFZ come responsibilities. We should be careful that the actions of an inconsiderate few do not jeopardise the future of an LFZ.

Requirements

Rule 91.311 allows training operations below 500 feet within a designated LFZ – provided that you have been authorised by an instructor and have been briefed on the operating procedures. Training activities must not create any hazard to persons or property on the surface.

Operating Considerations

Many LFZs are located over farmland that the owners have agreed to make available for flight training. This land may have stock on it, which can easily be disturbed, especially during lambing or calving. Care and consideration is required, and this also applies when manoeuvring near houses and structures in (or near) the LFZ. This is particularly important when climbing away after an exercise. Set up your exercise so that the resulting overshoot is directed away from any stock or buildings. When entering the LFZ, do not descend below 500 feet agl before reaching the boundary, and do not fly over buildings during descent. When vacating, manoeuvre so that you will reach at least 500 feet agl before reaching the boundary.

Summary

Many legitimate flying activities generate a lot of noise, and must be carried out near the ground. This time of year, frost protection is a prime example, but agricultural aviation often involves early starts, and a little consideration will pay off in the goodwill created. ■

Busy Time for Wanaka Airspace

The New Zealand Air Games will be held at Wanaka Aerodrome on 27 and 28 December 2007, featuring a series of competitions in various aviation disciplines. The event is not an airshow, but competing aircraft will include balloons, gliders, hang gliders, paragliders, parachutes, micro-lights and aerobatic aeroplanes.

A restricted area of 5 NM radius centred on Wanaka Aerodrome, and extending from the surface to 7500 feet amsl, will be established for the two competition days. If required for the reserve day of 29 December, it will be reactivated by NOTAM. Approval from the administering authority, Flying New Zealand (RNZAC), will be required for entry into the restricted area.

Starting on 27 December in conjunction with the New Zealand Air Games and continuing through to 6 January, the Wanaka Paragliding Festival will take place during daylight hours in uncontrolled airspace, within an area bounded by Queenstown, Mount Aspiring, Omarama and Cromwell. Up to 85 paragliders will be launching from various sites including Treble Cone, Mt Roy, Coronet Peak, Long Gully Station, and Waiorau Snow Farm ski area.

Both events are detailed in AIP Supplements 165/07 *Wanaka Aerodrome – NZ Air Games, NZR990* and 166/07 *Wanaka Paragliding Festival*, effective 22 November 2007. Reference to 165/07 is particularly important if you intend flying into the Wanaka area during the Games, as specific arrival and departure procedures will apply. These are similar to the Warbirds Over Wanaka procedures.

For non-subscribers to *AIP New Zealand*, the applicable supplements are available on the AIP web site: www.aip.net.nz. For further Games details, see the web site: www.airsportslive.com.

Surveillance System Detailed on CAA Web Site

The CAA web site now includes full details of the new surveillance system launched this year.

The new system integrates the CAA's certification, surveillance and risk profiling in a semi-automated system that is the first of its kind.

The system calculates assessments of the level of safety risk posed by each certificated aviation operator. It streamlines the CAA's audit and monitoring processes, and aligns these with the certification process.

The CAA web site now includes the background and philosophy to the new system, how it works, and what changes operators can expect to see. The site includes the list of risk factors that operators are assessed against, and the guidelines the CAA uses in its decision making. A list of frequently asked questions has also been developed.

View the detail under:
"About the CAA – CAA Surveillance".

Visual Signals

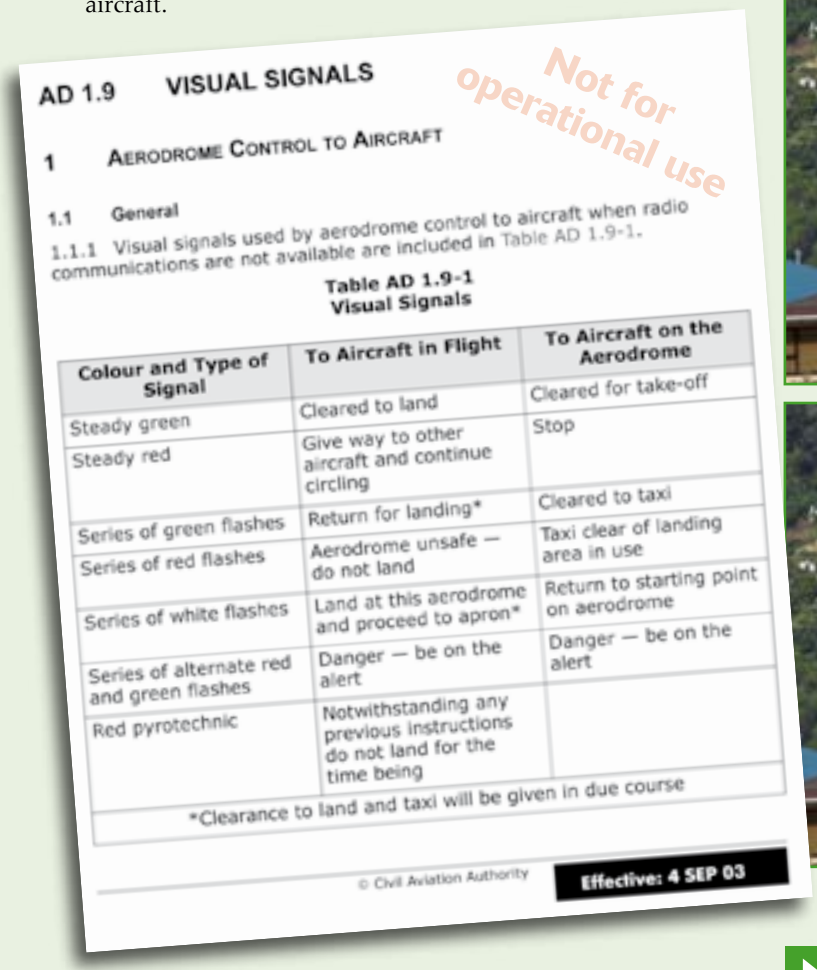
During handover from approach control to the tower, there has been a mix-up with the radio frequencies resulting in a loss of comms. The aircraft is on short final. Voices in the cockpit begin to get raised as it has been a long flight from Asia. Finally, the captain sees a green light from the tower, and heaves a sigh of relief as he is cleared to land.

In this situation the tower recognised that the aircraft was having communication problems and resorted to using a visual signal to issue a landing clearance.

It is important that pilots are familiar with the meanings of visual signals from a control tower as the signal will usually be received during a stage of a flight with a high workload.

Some pilots at Wellington Airport were asked recently if they knew the meaning of a signal from the tower to an aircraft. They were also questioned about where to find such information. Most were not familiar with the meaning of visual signals, and had the wrong location for the information. Information about visual signals is contained in the AD section of *AIP New Zealand*.

Visual signals from a tower are used to communicate an instruction to the pilot. The pilot is expected to comply, and acknowledge the instruction by rocking the wings of the aircraft.



AD 1.9 VISUAL SIGNALS

Not for operational use

1 AERODROME CONTROL TO AIRCRAFT

1.1 General

1.1.1 Visual signals used by aerodrome control to aircraft when radio communications are not available are included in Table AD 1.9-1.

Table AD 1.9-1
Visual Signals

Colour and Type of Signal	To Aircraft in Flight	To Aircraft on the Aerodrome
Steady green	Cleared to land	Cleared for take-off
Steady red	Give way to other aircraft and continue circling	Stop
Series of green flashes	Return for landing*	Cleared to taxi
Series of red flashes	Aerodrome unsafe — do not land	Taxi clear of landing area in use
Series of white flashes	Land at this aerodrome and proceed to apron*	Return to starting point on aerodrome
Series of alternate red and green flashes	Danger — be on the alert	Danger — be on the alert
Red pyrotechnic	Notwithstanding any previous instructions do not land for the time being	

*Clearance to land and taxi will be given in due course

© Civil Aviation Authority Effective: 4 SEP 03

AIP New Zealand Table AD 1.9-1 represents light signals that a tower may use to communicate to airborne or ground traffic.

A tower signalling an aircraft. This is what a pilot will see. (Note that towers and lights vary.)

Pilots are reminded that they should be familiar with light signals and their meanings.

Decoration for CAA Safety Seminar Presenter

CAA Safety Seminar presenter, Squadron Leader Jim Rankin, has been awarded the Distinguished Service Decoration, a New Zealand Royal Honour in recognition of distinguished military service.

The honour recognises the enormous contribution Jim has made to flight training in both the military and civil worlds. It was bestowed by the Governor-General at Government House in September 2007.

From his first flight in a glider at age 17, Jim has been passionate about flying. His deep connection with aviation has seen him fly almost everything – gliders, microlights, hang gliders, balloons, the Airtourer and Airtrainer basic trainers, the Strikemaster and Macchi jets, the Hercules, the Andover, the Fokker Tri-plane, the Harvard, the Tiger Moth, and all manner of civil and military aircraft.

He has trained hundreds of Air Force pilots, completely redesigned the Air Force's pilot and instructor training systems, is a former leader of the Red Checkers display team, and has even turned down senior military roles in favour of remaining behind the control column.

Jim is one of only a handful of people awarded the Air Force's highest flight instructor rating in the past 30 years. When the Macchi became New Zealand's advanced military trainer, it was Jim who designed its course syllabus.

Jim Rankin

Jim has landed the Hercules all over the world, from the United Kingdom to Antarctica. He has completed three tours in command of the Air Force's Central Flying School, and holds a Masters Degree with First Class Honours in atmospheric physics.

Throughout his Air Force career, Jim has remained deeply involved with civil aviation. He spends much of his leave from the Air Force presenting the CAA's AvKiwi seminars nationwide and two to three Aviation Safety Co-ordinator courses each year. He has been instrumental in linking the Air Force with the Royal New Zealand Aero Club, and the club now runs its annual instructor seminars at Ohakea.

Jim is also a former Chief Flying Instructor of the Canterbury Gliding Club and Pine Park Flying Club, and is the Display Controller for Warbirds over Wanaka. His other civil involvement and safety seminars have ranged from aerobatic display and formation flying to sport aviation.

And he shows no signs of slowing down. Jim has just signed up for a paragliding course, to get his PG1 rating; he is flight testing an RV-10, a four-seat high performance amateur-built, and he has spent the past year converting to helicopters with the Air Force. He has finished his Sioux course, and has nearly completed conversion to the Iroquois.

"Helicopters have not come naturally to me, I have had to work hard," Jim says.

"To be a really good pilot does require significant and ongoing effort. I am cautious. I've had accidents and I've been close to not coming home. It is quite sobering knowing that I have screwed up sometimes. The trick is to learn from that.

"Safety is totally interwoven with standards of instruction. Unless you can set standards early and maintain them, safety is compromised."

Next year Jim will deliver 10 of the CAA's 25 AvKiwi seminars.

"The AvKiwis have been incredibly successful. The people that go to them are so enthusiastic. They really want to learn. I can honestly say that almost everybody I meet in aviation would pass what I call the barbecue test. They are people you would want to invite over and spend time with." ■

Photography by Woolf

The Governor-General, the Honourable Anand Satyanand, presenting Jim Rankin with the Distinguished Service Decoration.

Maintenance Arrangement with Canada

The CAA and Transport Canada have signed a mutual technical arrangement covering Maintenance Organisations.

The full two-way Technical Arrangement means maintenance carried out by Part 145 certificated New Zealand maintenance organisations will be accepted by Transport Canada and vice versa.

The arrangement avoids duplication of inspections and evaluations, enabling each regulatory authority to accept the other's approval of maintenance organisations. New Zealand organisations can release products for service, such as engines, and have the work accepted in Canada.

A Rolls-Royce Dart engine being maintained at the Christchurch Engine Centre.

Manager Quality Assurance and Safety at the Christchurch Engine Centre, Ian Carmichael, says the arrangement allows the company to continue to maintain engines for Canadian airlines.

"The arrangement means Transport Canada will accept the safety oversight of the CAA, rather than having to send people over to New Zealand every year or so to make sure everything is still being done properly.

"That enables us to compete for work from Canadian operators on a pretty level playing field, against other international maintenance organisations, such as those from the United States," Ian says.

CAA Senior Adviser International Relations, Felicity Steel, says the arrangement has required changes to both the Civil Aviation Act 1990, and the Civil Aviation Rules.

"This kind of arrangement does not come easily. Transport Canada carried out rigorous checks of the CAA's safety regulation processes before signing the arrangement.

"It is an indication that New Zealand aviation is considered to be very well regulated," Felicity says.

You can read the detail of the Technical Arrangement on the CAA web site, see, "About the CAA – International Agreements and Arrangements".

Workshop for Senior Persons, Air Operations

The CAA will be holding further training workshops for Senior Persons responsible for Air Operations in organisations with Part 119/135 certification. The workshops will also be of interest to Part 137 Chief Pilots, and Chief Flying Instructors in organisations that hold, or will hold, Part 141 Certificates.

The aim of the workshop is to equip Senior Persons, Chief Pilots, Flight Operations Managers, and Chief Flying Instructors with an awareness of the responsibilities of their positions, and to cover the knowledge and tools needed to be an effective Senior Person.

The two-day course will cover the Civil Aviation Act, Civil Aviation Rules, and how operator expositions apply to the Senior Person/Chief Pilot role. The following practical day-to-day aspects of the job will also be covered: Standard Operating Procedures, records and rosters, crew and staff management, training and checking responsibilities, safety culture, and professionalism in the aviation environment.

Senior Persons Workshops

Christchurch **10 to 11 December 2007**

Copthorne Hotel Commodore, Christchurch Airport

Registrations close 1 December 2007

North Shore, Auckland **February 2008**

Details to be advised in the January/February 2008 *Vector*, and on the CAA web site.

A registration fee of $100 will be charged to help cover costs. Lunch and morning and afternoon teas will be provided on both days. Travel and accommodation is the responsibility of those attending.

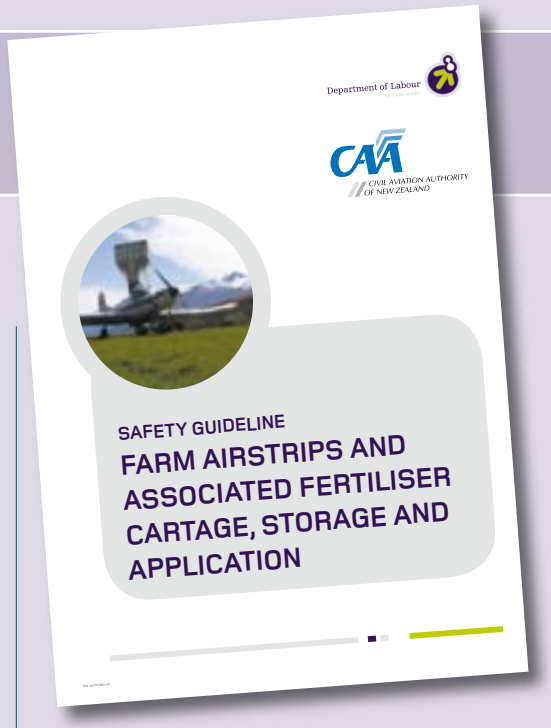
If you would like to attend the Christchurch workshop, please register by 1 December 2007. The registration form is on the CAA web site under, "Safety information – Seminars and Courses". Send by email, fax, or post, to:

Sue Holliday or Elizabeth Parlakchief
GA Group – CAA
P O Box 31-441
Lower Hutt 5040

Email: hollidays@caa.govt.nz or parlakchiefe@caa.govt.nz
Fax: 0–4–560 9611

Agricultural Aviation Conference

This year's Agricultural Aviation Association (AAA) conference focused on running a sound business in an industry that is dependent on the success of farming.



Civil Aviation Authority Member, Ross Crawford, attended the conference held in Queenstown in October.

"The theme was, 'The Business of Agricultural Aviation', and the entire first day covered business management, the future of farming, market outlook, liabilities and responsibilities, and legal perspectives.

"The conference featured consistently high quality speakers, and their selection and subject matter says a great deal for the professionalism of the Association. The second day was more operational, with greater membership involvement but equally pertinent," Ross said.

"It is good to see the industry engaging with these issues. The conference showed that agricultural operators can have a good level of confidence in their viability going into the future."

Ross is a former ag-pilot himself, having flown topdressing aircraft in Australia for a couple of years as a young pilot.

Safety was another dominant theme of the conference.

"It really underpinned everything. I was impressed by the earnest approach to safety. These people are not just paying lip service to the concept.

"Another key issue was a presentation on the, 'Safety Guideline – Farm Airstrips and Associated Fertiliser Cartage, Storage and Application', that is being distributed by the CAA. Incidentally, it was mentioned a couple of times that the CAA disseminating the booklet gave it credibility," Ross said.

Lawyer, Garth Gallaway, gave a legal view on liabilities and responsibilities. The main point was that, although this publication is a guideline, it should be treated by participants as mandatory. In any investigation following an incident, the question as to whether the guideline was applied will be asked. He emphasised that you cannot 'contract out' of requirements in the Health and Safety in Employment Act. Exclusion clauses may reduce civil liability, but not liability under the legislation.

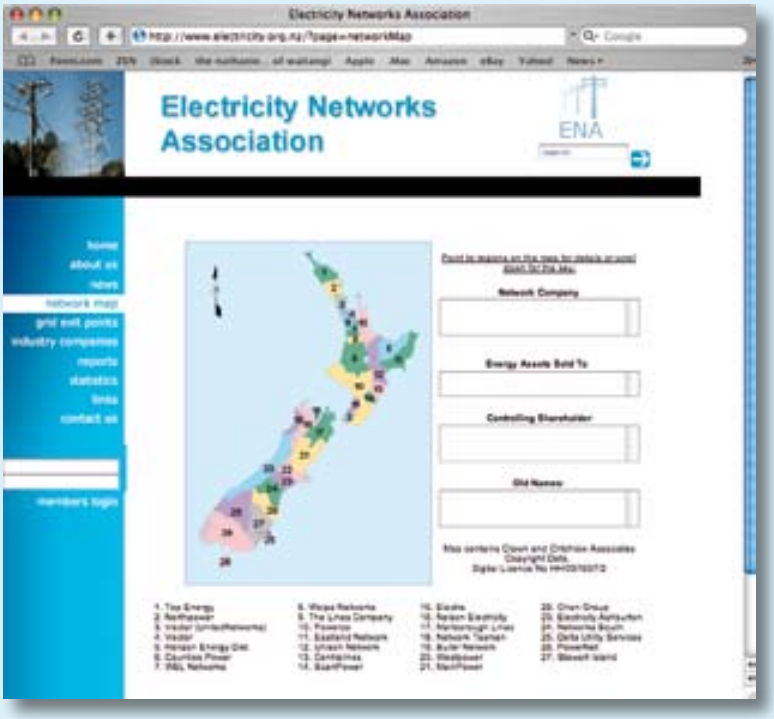
Over 2000 copies of the guideline have been distributed so far. As well as airstrip owners, the distribution has included companies and individuals involved in the manufacture, storage, and delivery of fertiliser products. ■

Electricity Lines

Electricity lines can be a significant hazard for low-level flying operations. In the past, it has been difficult to know who to contact to find out about electricity lines in an area, as there are many network providers in New Zealand.

The web site of the Electricity Networks Association now provides a map of New Zealand divided into regions showing the network company responsible for each region and their contact details. This resource could be useful for pilots when flight planning, in order to get information on electricity lines in a particular area directly from the network company concerned.

The link (www.electricity.org.nz/?page=networkMap) is on the CAA web site, see "Airspace – Fireworks, Model aircraft, Kites, Structures, Wires and other aerial hazards". ■



Aircrew Health and Safety Guideline Update

Promoting workplace health & safety on board aircraft

The January/February 2007 issue of *Vector* featured an article on the development of a Cabin Crew Safety Guideline. The scope of this Guideline has expanded to include flight crew, and the working title is *Occupational Health and Safety for Cabin Crew and Flight Crew – A Guideline for Health and Safety on board Aircraft*. The publication is being developed by the CAA's Health and Safety in Employment (HSE) Unit in consultation with industry.

The project leader for the Guideline is Janet Lammas, a Health and Safety Inspector with the HSE Unit, who recently completed an International Civil Aviation Organisation (ICAO) Cabin Safety Inspector course in Bangkok. Janet, who was the sole New Zealand representative out of 49 Asia-Pacific participants, said the course fitted in well with the Guideline work.

"The best aspects of the ICAO course were the networking, and sharing of ideas," said Janet Lammas.

Also involved in the development of the Guideline are an expert in fatigue management, reviewing the sections on stress and fatigue, and three representatives from the Accident Compensation Corporation (ACC) with specialist knowledge of injury prevention and management of noise in the workplace. The ACC representatives will be reviewing sections dealing with manual handling, slips, trips and falls, passenger luggage, and noise in the cabin and flight deck.

It is planned to have the first draft of the Guideline ready for release to the Industry Consultation Group by the end of 2007. As the Guideline progresses through the draft stages, two further meetings will be held with the group.

HSE Unit Manager, Ed Randell, said the Unit has now been operating for four and a half years and is taking a much more proactive approach towards airline crew health and safety.

"The ICAO course was an especially valuable opportunity to grow the expertise of the Unit's Inspectors," said Ed Randell. ■

"The best aspects of the ICAO course were the networking, and sharing of ideas."

Safety Seminar

A Cabin Safety Seminar is planned for April 2008 at the ICAO Asia Pacific Office in Bangkok, and besides the regulatory authorities, airlines in the Asia-Pacific Region will also be invited to attend. For those interested in obtaining information on the seminar, please email the HSE Unit at hsu@caa.govt.nz, and details will be provided as they become available.

Aviation Security Legislation Passed

Legislation to strengthen New Zealand's aviation security was passed by Parliament in September.

Transport Safety Minister Harry Duynhoven said, "In today's aviation security environment it is important that New Zealand's security measures are appropriate for our circumstances and ensure that we are not out of step with our closest neighbours and the international community. In addition, we must be mindful of the impact on the aviation industry and passengers.

"I am confident this legislation provides an appropriate balance between the rights of New Zealanders to travel to destinations of their choice, their expectations of privacy and the need to ensure our aviation security measures meet international requirements," said Mr Duynhoven.

The main elements and objectives of the legislation are to:

- Provide aviation security officers with the power to search for and seize items prohibited or restricted from being taken on aircraft.
- Enable the screening and searching of airport workers.
- Provide a power for aviation security officers to search passengers' outer garments and undertake pat-down searches.
- Require that airlines deny carriage to passengers who refuse to be searched.
- Provide a power for aviation security officers to seize potential weapons.
- Enable foreign in-flight security officers to enter and depart New Zealand and enable New Zealand to deploy in-flight security officers, should the Government decide to do so in the future.
- Formalise the process for checking the background of people working in areas critical to aviation security.
- Provide a general regulation making power to ensure that the law is able to respond to new aviation security matters in a timely fashion.

"This legislation will strengthen New Zealand's aviation security and enable us to continue to meet international security obligations set by the International Civil Aviation Organization", said Mr Duynhoven.

We will have more information about the screening of non-passengers and security enhanced areas in a future issue of *Vector*.

AV KIWI Safety Seminars

Time in your Tanks

Fuel Management

A lack of fuel can be hazardous to your health – whether it be from fuel starvation or fuel exhaustion. What's the difference? This question and many others will be answered in the 2008 series of AvKiwi seminars.

The seminar season takes off at Sportavex in Tauranga, with the first seminar on Saturday 16 February 2008. There will be 25 seminars in all, from Invercargill to Kerikeri – check out the next issue of *Vector* for further information and dates.

Airspace Consultation

An airspace consultation paper has been published on the CAA web site, under "Airspace – Airspace Review". The paper describes general proposals for airspace changes, and comment is invited. The philosophy of "use it or lose it" applies, so your feedback is important. Questions should be directed to Aeronautical Services Officer (ATS), Len Wicks, wicksl@caa.govt.nz, and submissions close on Friday 14 December 2007.

Aviation Safety Coordinator Course

Wellington

Thursday 21 and Friday 22 February 2008

Brentwood Hotel, Kilbirnie, Wellington

More details in next issue of *Vector*.

Answers to Aviation Quiz on page 12

1. A	**8.** D	**15.** D
2. B	**9.** C	**16.** C
3. C	**10.** B	**17.** B
4. B	**11.** C	**18.** B
5. C	**12.** C	**19.** C
6. B	**13.** B	**20.** A
7. B	**14.** B	

Exhaustive Enquiries

Foreign object debris, or FOD as it commonly known, is a constant threat to safety at aerodromes. The tragic consequences of FOD damage to the Air France Concorde in Paris a few years ago are a stark reminder of the devastating damage that FOD can cause.

The tasks of inspecting, collecting and removing FOD may appear menial, but constant vigilance is an important link in the safety chain.

CAA Field Safety Adviser, Ross St. George, was alerted to two metal objects that were found on the runway at Palmerston North International Airport in August and September 2006. What appeared to be pieces of aircraft exhaust systems were found on routine inspections of the sealed runway. The pieces appear to be curved metal exhaust components. But what are they exactly? Where did they come from? Could there be more bits missing, and what are the safety implications?

Enquiries Begin

The first object was quickly brought to the attention of the Operations Manager of Palmerston North airport. There was an obvious safety concern as the airport is used by a wide mix of aircraft, from light general aviation aircraft through to commercial jet transport operations. An additional runway inspection was made.

At that time no further debris was found, and attention turned to identifying an aircraft with damage to its exhaust system. Aircraft movement records were checked and all of the known operators of aircraft that had used the airport in the previous 24 hours were contacted. No one reported an aircraft with excessive noise, fumes in the cockpit, or reduced performance.

Ross St. George, asked local aircraft engineers to identify the component. All the engineers believed that the piece of FOD was from an aircraft exhaust system and concluded that it was most likely from a piston powered aircraft. But which type, and whereabouts in the exhaust system had this piece of FOD come from? All the possibilities and suggestions were followed up but no one could identify a specific exhaust system, or identify the aircraft type.

At the same time, enquiries were made about all vehicles approved to be on the runway or in the vicinity. No vehicle was missing an exhaust component. As an international airport, Palmerston North has full fencing and security, so it was unlikely to have unauthorised vehicles operating on the runway.

In the absence of an aircraft turning up with a piece of its exhaust obviously missing, theories about it being an internal component blown out had to be considered. The object is 6.5 cm wide at the widest point, which means that any exhaust outlet would need to be wider to eject the component.

There are aircraft with exhaust outlets sufficiently wide and there could be an exhaust out there that has lost an internal component. This may not become apparent until some form of inspection on the internal status of the exhaust is undertaken, or it fails further.

More Metal

In September 2006, a second almost identical piece of metal FOD was found at Palmerston North during a regular runway inspection. The same search scenarios were played out again, but similarly to no avail. It could not be positively identified with either a particular aircraft, or aircraft type, that had used the runway in the preceding 24 hours.

Since it could possibly come from some internal component of an aircraft exhaust system without there being an immediate external indication, one of the pieces was sent to John Hodgson of Specialised Welding Services in Nelson. John has many years experience in welding aircraft exhaust systems.

John ruled out a range of the common general aviation aircraft from the Piper and Cessna families. The next best suggestion was that these could be internal baffles from a Cessna 206. "There are a series of baffles inside the muffler of about this size, and the end pipe diameter would be wide enough," said John.

The problem was that from the airport data there were no C206 movements in the 24 hours prior to either occasion.

Enquiries were also made to the Australian company, Aerospace Welding, who also see many types of aircraft exhaust systems. They were equally baffled. Distorted exhaust chamber end caps were their best guess. They reported that most exhaust systems they were familiar with had a continuous baffle tube through the chamber.

Reminders

It is clear now that the effort put into trying to solve these metal mysteries may not be rewarded. We are relating the tale so you can appreciate how serious FOD is. Here are some reminders:

- Make your pre-flight inspections thorough.
- Always use a current CO detector.
- Always put FOD in the marked containers, unless you suspect that it came from an aircraft, in which case report it to the aerodrome operator.
- If you think that the FOD is a risk to safe operations, then report it to the aerodrome operator. ■

A Reminder From Personnel Licensing

If you are applying for the issue or amendment of CAA Licences, please get your applications in early if you require your licence before the Christmas/New Year holidays. This is a very busy time for personnel licensing and everyone considers their own applications urgent.

They are dealt with on a first-in, first-processed basis. Please do not call the Personnel Licensing Unit – this will not give your application greater priority, and it only takes staff away from the important job of processing the many licence applications.

Be aware that, if applying for a new licence, you will need to satisfy the Director that you meet the fit-and-proper person requirements of the Civil Aviation Act, and that obtaining the necessary information can take several weeks. As a rough guide, allow six weeks before your flight test to complete the FPP process.

Planning an Aviation Event?

If you are planning an event, large or small, such as an airshow, air race, rally, or major competition, the details should be published in an *AIP Supplement* to warn pilots of the activity.

The published cut-off dates for the AIP are listed below, but you must advise the CAA **at least one week** before those dates, to allow for inquiries and processing. Note that, even if you have applied to the CAA for an aviation event authorisation, this does not automatically generate an *AIP Supplement* or airspace request.

Email the CAA, aero@caa.govt.nz. Further information on aviation events is in AC91–1.

Supplement Cycle	*Effective Date*	*Cut-off Date With Graphic*	*Cut-off Date Without Graphic*
08/3	13 Mar 08	3 Jan 08	10 Jan 08
08/4	10 Apr 08	31 Jan 08	7 Feb 08
08/5	8 May 08	28 Feb 08	6 Mar 08

How to Get Aviation Publications

Rules, Advisory Circulars (ACs), Airworthiness Directives

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

AIP New Zealand

AIP New Zealand Vols 1 to 4 are 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).

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".

Field Safety Advisers

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OCCURRENCE BRIEFS

LESSONS FOR SAFER AVIATION

The content of *Occurrence Briefs* comprises notified aircraft accidents, GA defect incidents, and sometimes selected foreign occurrences, which we believe will most benefit operators and engineers. Individual accident briefs, and GA defect incidents are available on CAA's web site **www.caa.govt.nz**. Accident briefs on the web comprise those for accidents that have been investigated since 1 January 1996 and have been published in *Occurrence Briefs*, plus any that have been recently released on the web but not yet published. Defects on the web comprise most of those that have been investigated since 1 January 2002, including all that have been published in *Occurrence Briefs*.

ACCIDENTS

The pilot-in-command of an aircraft involved in an accident is required by the Civil Aviation Act to notify the Civil Aviation Authority "as soon as practicable", unless prevented by injury, in which case responsibility falls on the aircraft operator. The CAA has a dedicated telephone number 0508 ACCIDENT (0508 222 433) for this purpose. Follow-up details of accidents should normally be submitted on Form CA005 to the CAA Safety Investigation Unit.

Some accidents are investigated by the Transport Accident Investigation Commission (TAIC), and it is the CAA's responsibility to notify TAIC of all accidents. The reports that follow are the results of either CAA or TAIC investigations. Full TAIC accident reports are available on the TAIC web site, **www.taic.org.nz**.

ZK-RLM, Cessna U206F, 16 Jun 05 at 15:35, Cardrona. 5 POB, injuries nil, damage substantial. Nature of flight, transport passenger A to B. Pilot CAA licence CPL (Aeroplane), age 32 yrs, flying hours 538 total, 273 on type, 38 in last 90 days.

Landing on Cardrona Valley strip, the pilot made a steeper than normal approach. Decreasing speed to cross the fence at 55 kts, the pilot applied power for touchdown. The aircraft landed heavily. The ground roll seemed normal, however, and there was no indication of tail strike obvious at the time. It wasn't until a pre-flight inspection the following day that damage to the aircraft rear fuselage was noticed. Replacement of rear stringer, aft bulkhead and lower skin was required.

CAA Occurrence Ref 05/1968

ZK-XBD, Bede BD-5B, 25 Oct 05 at 13:00, Dunedin Ad. 1 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 51 yrs, flying hours 302 total, 54 on type.

The aircraft experienced an engine failure while in the downwind position. During the landing the aircraft's right wing clipped a runway light, causing a loss of control.

CAA Occurrence Ref 05/3387

ZK-CPD, Champion 7ECA, 12 Dec 05 at 11:30, Waipukurau. 1 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 71 yrs, flying hours 691 total, 150 on type, 7 in last 90 days.

As the aircraft was taxiing clear at walking pace, it tilted left until the wing touched the ground. A verbal report by the engineer suggested that the undercarriage failure was due to a recent heavy landing, although none had been observed or reported by club members or observers.

CAA Occurrence Ref 05/4054

ZK-GXO, PZL-Krosno KR-03A "Puchatek", 28 Mar 06 at 10:09, Drury Ad. 2 POB, injuries, 1 serious, 1 minor, damage substantial. Nature of flight, training dual. Pilot CAA licence nil, flying hours 2483 total, 294 on type, 38 in last 90 days.

During a winch launch, the glider lifted off but levelled out before rotating into a climb. Soon after, the parachute on the cable opened, and the instructor-pilot released it from the glider. The glider, however, was in a nose-high attitude, which the instructor could not recover from, and the glider landed heavily, causing major damage.

CAA Occurrence Ref 06/1093

ZK-BQS, Piper PA-18, 1 Oct 06 at 15:00, Wigram Ad. 2 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 38 yrs, flying hours 192 total, 12 on type, 17 in last 90 days.

During landing the aircraft experienced a ground-loop. The pilot applied full power to takeoff but lost directional control. The aircraft became airborne, but its wings were now perpendicular to the runway. A further turn to clear obstructions meant the aircraft was now flying downwind at 10 to 15 ft agl. The aircraft then stalled, coming down on its left wing, undercarriage and tailplane.

CAA Occurrence Ref 06/3641

ZK-HUC, Robinson R44 II, 9 Nov 06 at 13:56, Motukutuku Pt. 4 POB, injuries 1 serious, damage minor. Nature of flight, Policing. Pilot CAA licence CPL (Helicopter), age 30 yrs, flying hours 1694 total, 540 on type.

On Thursday 9 November 2006, ZK-HUC, a Robinson R44 helicopter carrying 3 police officers and the pilot, collided with an electricity transmission line during a coastal search. The helicopter incurred minor damage and the pilot landed immediately. He subsequently twice shifted the helicopter to avoid sea damage and to facilitate the recovery of the helicopter. The pilot received a serious injury but none of the passengers was injured. The flight was a permissible low-level operation conducted at an appropriate speed and height, but the pilot had not clearly briefed his passengers on the possible hazards at low level, nor had he conducted any form of reconnaissance prior to the low-level part of the flight.

CAA Occurrence Ref 06/4143

ZK-IAS, Robinson R22 Beta, 2 Dec 06 at 12:00, Ashburton River. 2 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Helicopter), age 36 yrs, flying hours 325 total, 76 on type, 33 in last 90 days.

The helicopter lost power on lift off. The pilot tried a run-on landing, but the skids hit some rocks and the helicopter rolled over. The pilot attributed the accident to overpitching of the main rotor.

CAA Occurrence Ref 06/4475

ZK-REX, Vans RV 7A, 8 Dec 06 at 12:15, Omaka. 1 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 50 yrs, flying hours 257 total, 123 on type, 16 in last 90 days.

The aircraft bounced on landing; the nosewheel collapsed after the second bounce, allowing the aircraft nose to dig in.

CAA Occurrence Ref 06/4584

ZK-HBC, Bell 206B, 12 Dec 06 at 4:50, Waipapakauri. 1 POB, injuries nil, damage substantial. Nature of flight, other aerial work. Pilot CAA licence CPL (Helicopter), age 63 yrs, flying hours 15,000 total, 5000 on type, 41 in last 90 days.

The helicopter's tail rotor struck the fire bucket during a landing. The helicopter began to oscillate, so the pilot immediately put the helicopter onto the ground. No injuries occurred but the aircraft damage was beyond economical repair.

CAA Occurrence Ref 06/4646

ZK-FEL, Piper PA-28-180, 4 Jan 07 at 14:45, North Shore. 2 POB, injuries nil, damage substantial. Nature of flight, training dual. Pilot CAA licence CPL (Aeroplane), age 31 yrs, flying hours 1300 total, 400 on type, 130 in last 90 days.

During dual circuit training the aircraft experienced sink on short final; the instructor took control and applied full power in an attempt to arrest the rate of descent. Too late. The aircraft landed short of the runway, then became airborne and struck a fence. The go-around was successfully completed, and the subsequent landing was normal. The aircraft suffered substantial damage to both wings and minor fence wire damage to the propeller and windscreen.

CAA Occurrence Ref 07/5

ZK-EOQ, Cessna 152, 31 Jan 07 at 11:40, Masterton Ad. 1 POB, injuries nil, damage substantial. Nature of flight, training solo. Pilot CAA licence nil, age 19 yrs, flying hours 39 total, 39 on type, 39 in last 90 days.

After the aircraft touched down heavily, the nosewheel failed rearwards. Then the propeller struck the tarmac and bent rearwards.

CAA Occurrence Ref 07/250

ZK-BTH, Piper PA-18A-150, 20 Feb 07 at 10:15, Sherenden. 2 POB, injuries, 1 minor, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 36 yrs, flying hours 800 total, 40 on type, 25 in last 90 days.

While landing the pilot realised the aircraft was going too fast. As the end of the airstrip was approaching, the pilot applied full power in an attempt to go around. The aircraft became airborne but clipped a wire fence and collided with the terrain, coming to rest inverted in a paddock. The pilot received minor injuries and the aircraft substantial damage.

CAA Occurrence Ref 07/445

ZK-NSF, Cessna A152, 24 Feb 07 at 10:27, Palmerston North Ad. 1 POB, injuries nil, damage substantial. Nature of flight, training solo. Pilot CAA licence nil, age 23 yrs, flying hours 56 total, 56 on type, 51 in last 90 days.

The student landed the aircraft heavily on the runway, bounced, experienced propeller strike, and then the nosewheel collapsed. The aircraft veered off the runway.

CAA Occurrence Ref 07/540

ZK-EBC, Piper PA-28-140, 17 Mar 07 at 13:00, West Melton. 2 POB, injuries nil, damage substantial. Nature of flight, training dual. Pilot CAA licence CPL (Aeroplane), age 30 yrs, flying hours 510 total, 192 on type, 50 in last 90 days.

The instructor was giving dual flight instruction in crosswind circuits at West Melton utilising Runway 22. As the aircraft touched down, a gust from the right side caused significant loss of both control and performance. The instructor took control but could not recover the situation with a go-around, and the aircraft ended up in a paddock parallel to Runway 22. The aircraft then swung around in a westerly direction, causing damage to the nose and both wings.

CAA Occurrence Ref 07/999

ZK-DOJ, Piper PA-32S-300, 5 Apr 07, Elfin Bay. 3 POB, injuries nil, damage substantial. Nature of flight, transport passenger A to B. Pilot CAA licence CPL (Aeroplane), age 44 yrs, flying hours 2404 total, 501 on type, 111 in last 90 days.

After a normal approach the initial landing roll seemed normal, and the pilot retracted the manual flap; he then applied brakes but to no effect. He then tried to turn the aircraft; it skidded through the fence on the left side of the strip, breaking its nose-gear and damaging some other parts before stopping.

CAA Occurrence Ref 07/1118

ZK-JNX, NZ Aerospace FU24-954, 16 Apr 07 at 16:00, Te Poi. 1 POB, injuries nil, damage substantial. Nature of flight, agricultural. Pilot CAA licence CPL (Aeroplane), age 45 yrs, flying hours 11453 total, 11150 on type, 260 in last 90 days.

Continued over...

... continued from previous page

The pilot was using the airstrip for the first time. On landing he misjudged the line of the airstrip and landed in a depression towards the side of the airstrip. This resulted in the spreader contacting the ground and being torn off, causing damage to the fuselage, left flap and elevator.

CAA Occurrence Ref 07/1191

ZK-TDS, Maule MX-7-180B, 19 Apr 07 at 14:30, Karamea Bend. 1 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence ATPL (Aeroplane), age 53 yrs, flying hours 15496 total, 168 on type, 226 in last 90 days.

The pilot carried out a precautionary landing following high engine oil temperature and low oil pressure readings. The left undercarriage collapsed on touchdown because of the terrain.

CAA Occurrence Ref 07/1282

ZK-MAA, Air Tractor AT-502B, 8 May 07 at 16:30, Five Rivers. 1 POB, injuries nil, damage substantial. Nature of flight, agricultural. Pilot CAA licence CPL (Aeroplane), age 38 yrs, flying hours 6129 total, 360 on type, 196 in last 90 days.

As the aircraft was approaching takeoff speed it went over a bump on the airstrip. It became airborne but then sank heavily back on to the ground. It then pitched forward and the propeller struck the ground and feathered. The aircraft then bounced over an open drain, skidded through some rough tussock-covered ground, crossed another open drain, and came to rest about 150 metres from the initial propeller strike.

CAA Occurrence Ref 07/1523

ZK-HCJ, Robinson R22 Beta, 17 Jun 07 at 10:15, South Canterbury. 2 POB, injuries, 2 minor, aircraft destroyed. Nature of flight, private other. Pilot CAA licence PPL (Helicopter), age 32 yrs, flying hours 355 total, 355 on type, 50 in last 90 days.

The pilot was looking for sheep and cattle when the helicopter's engine lost power. A decision was then made to land on a hillside, but during the descent all power was lost. The helicopter rolled down the hillside, but both passenger and pilot were able to walk out with only minor injuries.

CAA Occurrence Ref 07/2152

GA DEFECTS

The reports and recommendations that follow are based on details submitted mainly by Licensed Aircraft Maintenance Engineers on behalf of operators, in accordance with Civil Aviation Rules, Part 12 *Accidents, Incidents, and Statistics*. They relate only to aircraft of maximum certificated takeoff weight of 9000 lb (4082 kg) or less. These and more reports are available on the CAA web site, www.caa.govt.nz. Details of defects should normally be submitted on Form CA005 or 005D to the CAA Safety Investigation Unit.

The CAA Occurrence Number at the end of each report should be quoted in any enquiries.

Key to abbreviations:

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

Bell 206B
Bell 206 Spindles P/N 206-031-554

While completing the airworthiness directive DCA/BELL206/90, the serial numbers of the transmission pylon support spindles could not be established due to the thickness of the paint. Therefore, as the airworthiness condition of the spindles could not be established, they were replaced.

ATA 6300 CAA Occurrence Ref 07/1037

Cessna U206G
ECI IO-520-F Cylinder P/N AEC631397

Cylinder head separated from barrel between 6 and 7 fin position. It appeared that the initiating crack may have propagated from a cylinder head barrel thread. The engine had previously suffered a mishap where it was mistakenly operated on Jet A-1 fuel. It was recommended that the engine cylinders be inspected at intervals not exceeding 50 hours. TTIS 405 hours.

ATA 7100 CAA Occurrence Ref 06/4955

Cessna 207
Engine Cylinder P/N 631397AEC

On a pre-flight run-up, the engine was found to be chuffing. An investigation revealed No 3 cylinder was cracked and blowing on the exhaust side of cylinder head. This cylinder is one of a series of EC cylinders that are subject to service bulletin MSB06-2.

ATA 8530 CAA Occurrence Ref 06/4381

Grumman American AA-1C
Lycoming O-235-L2C Engine

The aircraft's engine stopped while the aircraft was taxiing off the main runway. The engine idle was adjusted. There have been no other reported occurrences of the engine stopping during taxi.

ATA 7200 CAA Occurrence Ref 07/1125

Hughes 269C
Hughes 269C Fuel tank

Foreign objects were found in the fuel tank during inspection. Synthetic gaskets used in the filler necks of jerry cans are breaking and falling inside the helicopter's fuel tank during the refuelling process. It is possible that the accumulation of gaskets could block off the fuel tank outlet. Steps are under way to circulate information about the problem around the industry through educational material and notices. TTIS 3005.1 hours.

ATA 7300 CAA Occurrence Ref 07/1436

Hughes 369D

Rolls Royce PC line P/N 6876542

The helicopter pilot noticed a droop in rotor rpm while doing a lifting job. An engineer replaced the governor, but the problem recurred on the next lifting job. The PC line was found incorrectly secured; this caused a small leak near the flare at the filter end. The line was replaced and secured properly.

ATA 7310 CAA Occurrence Ref 07/1193

McDonnell Douglas 500N

MD Helicopters MD520N control rod P/N 500N7113 -11

During a post-flight inspection, the NOTAR anti-torque fan pitch change shaft was found to be fractured. The rod was replaced.

ATA 6720 CAA Occurrence Ref 06/4014

NZ Aerospace FU24-954

Engine Mount

During a 100-hour inspection of the aircraft, it was found that the lefthand engine mount on the firewall was broken. A new part was fitted.

ATA 7120 CAA Occurrence Ref 06/4372

Pacific Aerospace Cresco 08-600

PAC Leading Edge Skin P/N 242308-3

The fin leading edge skin P/N 242308-3 was found to be cracking from top of cut-out area for bulkhead P/N 242305-2. Cause, corrosion fatigue. Leading edge skin replaced. TSI 96 hours, TTIS 5877 hours.

ATA 5530 CAA Occurrence Ref 07/1266

Piper PA-34-200T

Tyre tube

During the landing roll, the pilot reported a problem with the left gear to the Tower. Tower advised that the left main tyre appeared to be flat. The aircraft taxied clear of the active runway and shut down. The investigation found that the tyre had separated partly from the wheel rim as a result of rolling on the flat tyre. A small hole was located in the tyre tube. The tyre was on the wear limits. The tyre and tube were replaced.

ATA 3241 CAA Occurrence Ref 06/4434

Robinson R22 Beta

Robinson Bearing Block Support Bracket P/N A359-2

During a training flight, autorotation was being carried out at 1000 ft agl into the prevailing wind. Following the flare, a power recovery was executed by student at 6 ft agl. During this power recovery, and upon input of left tail rotor pedal, a loud bang was heard. Pedals were found to be jammed. Upon assessing normal cyclic and collective control, the helicopter was flown by the P-in-C to an airstrip adjoining a maintenance facility. A precautionary landing was made in accordance with a pedal jam scenario. The helicopter was inspected by maintenance staff. Investigation revealed that RH Bearing Block Support Bracket P/N A359-2 had failed, allowing the bearing block to move out of alignment and jam the pedals. TSO 1338 hours, TTIS 3302 hours.

ATA 6720 CAA Occurrence Ref 07/1675

Robinson R44

Onboard Systems Talon LC Cargo Hook internal release toggle P/N 528-010-00

On opening the hook for a scheduled inspection, the internal release toggle P/N 290-285-00 was found to have cracked across the leg, from the roller retaining pin hole to the edge of leg. Further failure has potential of hook releasing load during flight. The manufacturer was informed, and a warranty replacement toggle was supplied. TSI 466.7 hours, TTIS 466.7 hours.

ATA 5340 CAA Occurrence Ref 06/3613

Robinson R44

Robinson Aircraft seal P/N D212-1

Hydraulic oil leaking from a defective servo seal caused the right front transmission mount to disintegrate. The hydraulic servo seals were replaced, and a small bead of sealer was put at both ends of the channel, stopping any further leaks from reaching the transmission mounts, which were replaced with new parts.

ATA 6730 CAA Occurrence Ref 06/4583

Robinson R44 II

Main Rotor Spindle Bearing P/N C159-1

During 100-hr inspection, main rotor head teeter friction was found to be low. MR blades removed for access. During removal, MR Blade #1651C noted to have a notchy feel to spindle. Boot released and spindle turned. Spindle found to be excessively stiff to rotate and occasionally locked up, requiring large forces to rotate. Spindle bearing found to be brinelled, with a significant amount of bearing material found in the oil and blade root. The maintenance engineer was concerned that this defect would not have been found if the teeter hinge friction had been correct. The hydraulic controls prevented any control feedback through to the pilot, unlike earlier machines. Therefore, the bearing could well have failed completely without any prior indication, as there is no requirement to remove the blades as per the R22. The spindle bearing was replaced by a R44 overhaul manual component, and the blade was returned to service. TTIS 500 hours.

ATA 6200 CAA Occurrence Ref 07/1281

Robinson R44 II

Lycoming IO-540AE1A5 Piston P/N Lw10270S

Oil was observed to be dripping from the induction drain. The engine was removed for top overhaul, revealing that number 4 cylinder piston oil control ring was broken, and that there was severe damage to piston lands. All the cylinders were overhauled, and number 4 piston and rings were renewed. TTIS 1304 hours.

ATA 8530 CAA Occurrence Ref 07/1488

Robinson R44 II

Onboard Systems Cargo Hook Link P/N 232-950-00

The cargo hook link failed at the attachment bush, dropping the cargo hook and fire bucket. The bucket was released when the release cable pulled tight. Gimbal part number 232 049 01 was also cracked. Cause not determined. Gimbal, bolt link, and release cable replaced. TTIS 1640 hours.

ATA 2550 CAA Occurrence Ref 06/4638

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 *Supplements* for free from www.aip.net.nz.

The map shows the known flying events between December 2007 and mid-March 2008.

North Shore
Brian Langley Memorial Aerobatic Competition
19 January 2008

Auckland
Air Show (Browns Bay)
29 November to 1 December 2007

Matamata
Walsh Memorial Flying School
CTR NZA292
9 to 22 January 2008

NZ National Gliding Contest
NZR298 NZR299
3 to 15 February 2008

Hamilton
Wings and Wheels over Waikato
7 to 9 March 2008

Tauranga
Sportavex Fly-In and Airshow
15 to 17 February 2008
Airshow *17 February 2008*
NZR295

Taupo
Centennial Park Air Show
2 February 2008

Waipukurau
RAANZ National Fly-in
7 to 9 March 2008

Kapiti-Horowhenua-Wairarapa
NZ Hang Gliding Championships
9 to 17 February 2008

Wairarapa
Hot Air Balloon Contest
26 to 30 March 2008

Nelson Lakes
NZ Paragliding Championships
In an **area encompassing** Nelson, Hanmer Springs, Murchison and Tapawera.
25 January to 2 February 2008

Woodbourne
Air Training Corps National Aviation Course
8 to 17 January 2008

Military Exercise Skytrain 08
3 to 13 March 2008

Central South Island Gliding Contest
In an **area encompassing**, Mt Cook, Benmore, Cromwell Racecourse AD, Wanaka AD, and Lake Hawera.
19 to 24 December 2007

Timaru
RNZAC Flying Championships
5 to 10 February 2008

Military Exercise Wise Owl 90
26 February to 6 March 2008

Queenstown
Gliding
Temporary General Aviation Area NZG995
22 November 2007 to 12 March 2008

Wanaka
NZ Air Games
NZR990
26 to 29 December 2007

Paragliding Festival
27 December 2007 to 6 January 2008

Warbirds over Wanaka
20 to 24 March 2008

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND