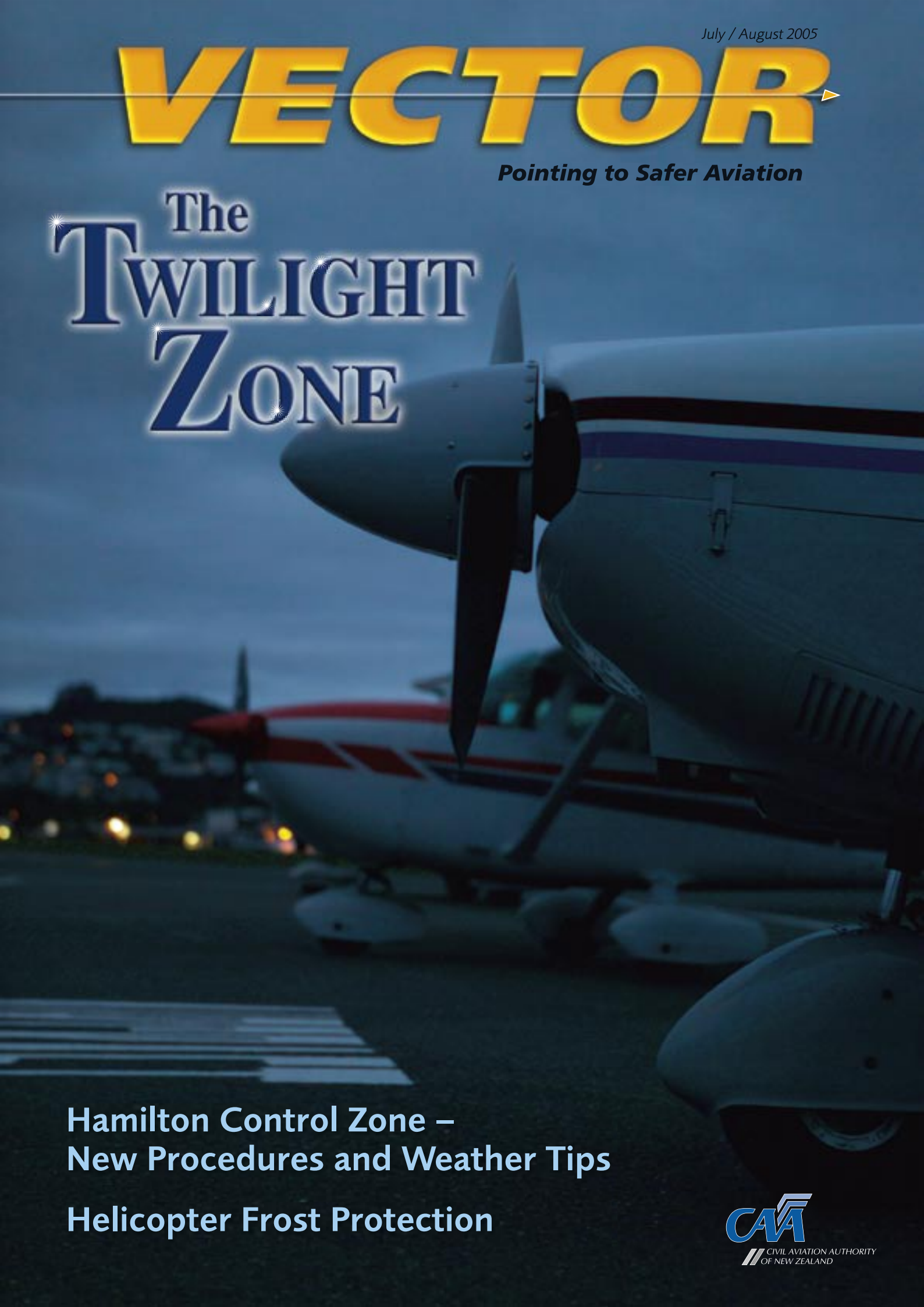
July / August 2005

# VECTOR

Pointing to Safer Aviation



## The Twilight Zone

## Hamilton Control Zone – New Procedures and Weather Tips

## Helicopter Frost Protection

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

# VECTOR CAA NEWS

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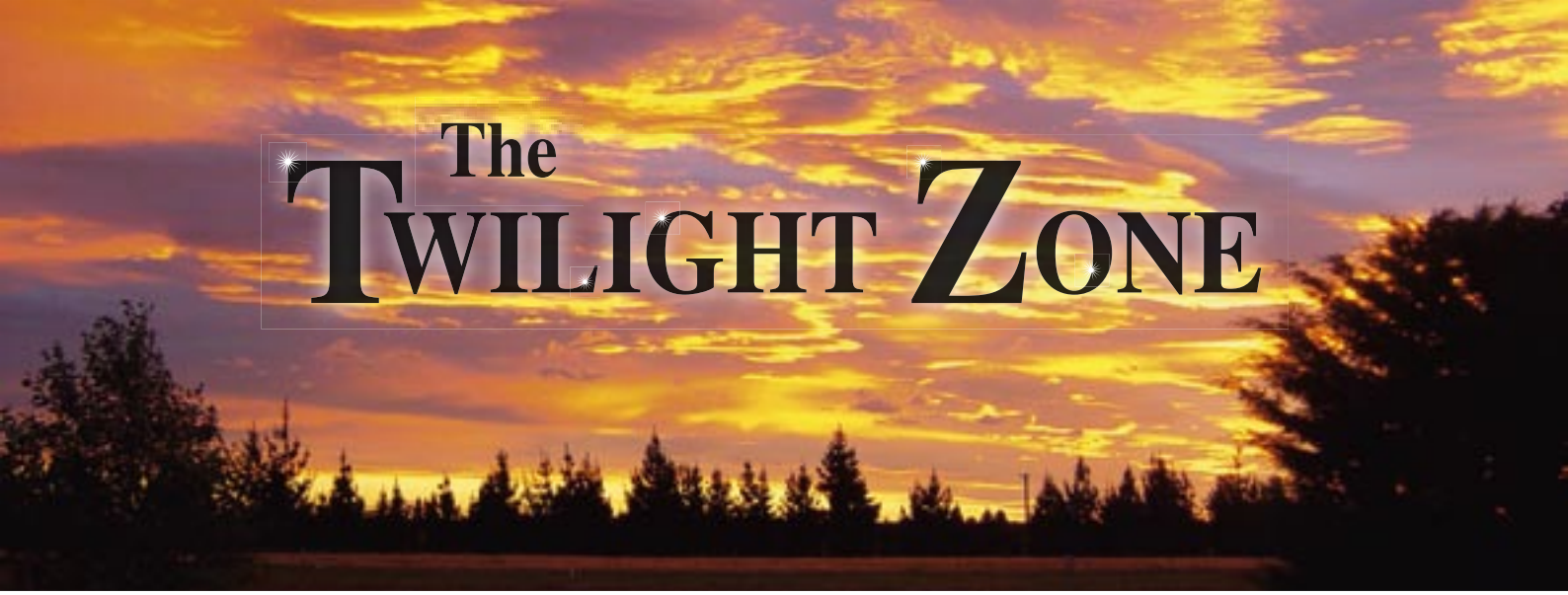
**Cover:** Twilight at Wellington Airport



# The Twilight Zone

An important consideration when planning a VFR cross-country flight during winter is that there are fewer hours of daylight. In winter, there are approximately nine and half hours of daylight available, but this varies around New Zealand. It is not uncommon for the available daylight time to be further reduced by weather. For example, mist or fog can cause delays in the morning, leaving only the afternoon to achieve your flight during the day. In this situation if you do not have night privileges, it's important to know the Evening Civil Twilight for your destination aerodrome and plan to land at least 30 minutes before then; it gets dark quickly, and it is easier to secure your aircraft in daylight.

## Daylight Zones

In *AIP New Zealand* GEN 2.7-1 to 2.7-7, daylight zones and associated tables are provided to assist in working out the Morning Civil Twilight (MCT) and Evening Civil Twilight (ECT) around New Zealand (Figures 1, 2).

A common misconception is that, during winter, the further south in New Zealand, the later the MCT and earlier the ECT. This is correct only for MCT. For example, on the shortest day (21 Jun), MCT is 0707 NZST in Zone 1 and increases to 0757 NZST in Zone 8. This means that dawn is earlier in the northern areas of New Zealand. For ECT, however, the times are 1740 NZST in Zone 1 and only 1741 NZST in Zone 8.

*Continued over ...*

| Zone | JUN 7 | JUN 14 | JUN 21 | JUN 28 | JUL 7 | JUL 14 | JUL 21 | JUL 28 | AUG 7 | AUG 14 | AUG 21 | AUG 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1901<br>0540 | 1905<br>0539 | 1907<br>0540 | 1907<br>0542 | 1907<br>0546 | 1905<br>0551 | 1902<br>0555 | 1857<br>0600 | 1849<br>0607 | 1842<br>0613 | 1835<br>0618 | 1826<br>0624 |
| 2 | 1858<br>0523 | 1902<br>0523 | 1904<br>0524 | 1905<br>0525 | 1904<br>0530 | 1901<br>0535 | 1858<br>0539 | 1853<br>0544 | 1844<br>0551 | 1835<br>0558 | 1828<br>0603 | 1817<br>0610 |
| 3 | 1908<br>0530 | 1911<br>0529 | 1913<br>0530 | 1914<br>0532 | 1913<br>0536 | 1911<br>0541 | 1907<br>0546 | 1901<br>0551 | 1852<br>0559 | 1843<br>0606 | 1836<br>0611 | 1825<br>0618 |
| 4 | 1917<br>0526 | 1921<br>0525 | 1923<br>0526 | 1924<br>0528 | 1922<br>0533 | 1919<br>0538 | 1915<br>0542 | 1909<br>0549 | 1900<br>0557 | 1851<br>0603 | 1841<br>0610 | 1829<br>0617 |
| 5 | 1923<br>0536 | 1927<br>0535 | 1929<br>0536 | 1930<br>0538 | 1928<br>0543 | 1925<br>0548 | 1922<br>0552 | 1917<br>0559 | 1907<br>0607 | 1859<br>0614 | 1848<br>0620 | 1837<br>0627 |
| 6 | 1935<br>0533 | 1939<br>0531 | 1941<br>0532 | 1942<br>0534 | 1940<br>0540 | 1936<br>0545 | 1932<br>0550 | 1926<br>0556 | 1915<br>0606 | 1904<br>0613 | 1854<br>0620 | 1841<br>0629 |
| 7 | 1944<br>0535 | 1948<br>0534 | 1950<br>0535 | 1951<br>0537 | 1949<br>0542 | 1945<br>0547 | 1941<br>0553 | 1935<br>0601 | 1923<br>0611 | 1913<br>0619 | 1903<br>0627 | 1850<br>0635 |
| 8 | 1951<br>0542 | 1955<br>0540 | 1957<br>0541 | 1958<br>0544 | 1956<br>0548 | 1953<br>0554 | 1948<br>0600 | 1941<br>0608 | 1929<br>0618 | 1919<br>0627 | 1907<br>0634 | 1856<br>0643 |

**Figure 1.** *The daylight tables detail the MCT and ECT for each zone (during winter) in Coordinated Universal Time (UTC). The top figure in each cell is MCT, the other figure ECT. New Zealand Standard Time (NZST) is 12 hours ahead of UTC during winter.*

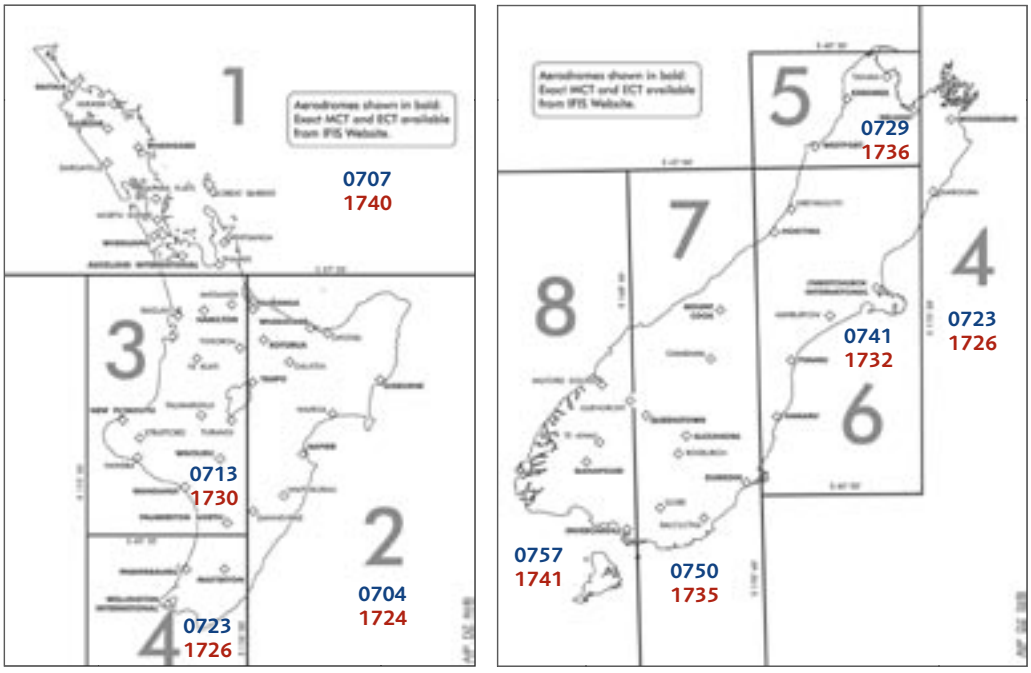



**Figure 2.** *New Zealand has been divided into eight daylight zones for the purpose of simplifying the planning of VFR flights around the country. In our illustration of the daylight zones, we have superimposed MCT (in blue) and ECT (in red) in local time for 21 June.*

... continued from previous page

ECT varies longitudinally; western areas of New Zealand have a later ECT than eastern areas. For example, on the shortest day, ECT is 1724 NZST in Zone 2 and increases to 1741 NZST in Zone 8. This means that dusk is earlier in the eastern areas of New Zealand.

If you are planning a cross-country flight in the afternoon, then take careful note of the ECT of the daylight zone that your destination aerodrome is in. Remember that if you do not have a night rating, or you are not current to fly at night (refer to Civil Aviation Rules, Part 61 *Pilot Licences and Ratings)*, then your flight is required to be completed during the **day**, ie between MCT and ECT (see Civil Aviation Rules, Part 1, *Definitions*). It is, therefore, prudent to check the exact ECT for your destination aerodrome, as it is slightly different for each aerodrome inside the same zone. For example, Gisborne and Taupo aerodromes are located within Zone 2, but ECT at Taupo occurs eight minutes after that at Gisborne.

To check the exact MCT or ECT at most New Zealand aerodromes, visit the IFIS web site, www.ifis.airways.co.nz.

*Sun strike can make it difficult, or impossible (especially if the windscreen is dirty), to judge the approach and landing on a runway which faces into the sun.*

## In-Flight Considerations

During winter, the sun throughout the day is lower in the sky (in technical terms a lower solar azimuth). This can produce a variety of lighting conditions resulting from topography and cloud cover. For example, when flying in the mountains, deep shadows can occur in the valleys, making it difficult to see – especially in the early morning or late afternoon.

If you are flying in the late afternoon, in clear skies, you may not realise how dark it is getting on the ground, as it is lighter at altitude. This difference is exaggerated when flying around mountainous topography, as it provides further shading. For example, a pilot can be lured into a false sense of security when flying southwest along the West Coast of the South Island.

**Figure 3. Lighting conditions at Forest Field aerodrome during June 2005**


*The photos on the left show the lighting conditions at Forest Field aerodrome 30 minutes before ECT. The photos on the right were taken at ECT.*

**Figure 4.** Lighting conditions at Queenstown


*This series of photos was taken at Queenstown aerodrome on 6 June 2005.*

As ECT approaches, the sky ahead and to the west is light (assuming limited or nil cloud cover), especially at higher altitudes. This provides a pilot with confidence that lighting will not be an issue. If, however, the destination is east of the Southern Alps (for example through Haast Pass to Queenstown or Wanaka), the pilot may find the lighting considerably different – it can be dark and intimidating for a landing on the valley floor. If cloud cover exists in these circumstances, the lighting conditions even 30 minutes before ECT can be quite dark in the valleys east of the Southern Alps.

The lower position of the sun can cause sun strike in the early morning and late afternoon. This can make it difficult, or impossible (especially if the windscreen is dirty), to judge the approach and landing on a runway which faces into the sun.

Cloudy days appear to get darker earlier than clear days. Figure 3 shows the difference in lighting in the late afternoon between a clear day and a cloudy day at Forest Field aerodrome (Canterbury Plains). The photo on the bottom left shows that on a cloudy day it is already beginning to get gloomy. In this situation, if the aerodrome had lighting it could be worthwhile having it switched on to assist you in navigating to the aerodrome.

During winter it gets dark quickly. Figure 4 shows a time series of photos at Queenstown aerodrome with the Remarkables Range in the background, counting down to ECT from 60 minutes before. At 45 minutes, sunlight breaks through the cloud, and the lighting conditions change on the Remarkables Range. Note the large change in lighting between 30 minutes before ECT and at ECT.

## Conclusion

If you are planning a cross-country flight in the afternoon, then take careful note of the ECT for your destination aerodrome. You can check ECT by referring to the daylight tables in *AIP New Zealand* GEN 2.7 - 1 or by visiting the IFIS web site, www.ifis.airways.co.nz. Remember that ECT occurs at an earlier time in eastern areas of New Zealand than western areas. Be aware that lighting conditions during a winter day (particularly late in the day) will vary significantly with topography and overhead sky conditions. These variables are why it is advisable to plan to arrive at your destination half an hour **before ECT**, to allow for flight delays and also to allow you to secure your aircraft in daylight. ■

# HAMILTON CONTROL ZONE – New Procedures and Weather Tips

Photo courtesy of Hamilton International Airport

Hamilton Aerodrome on 29 April 2003

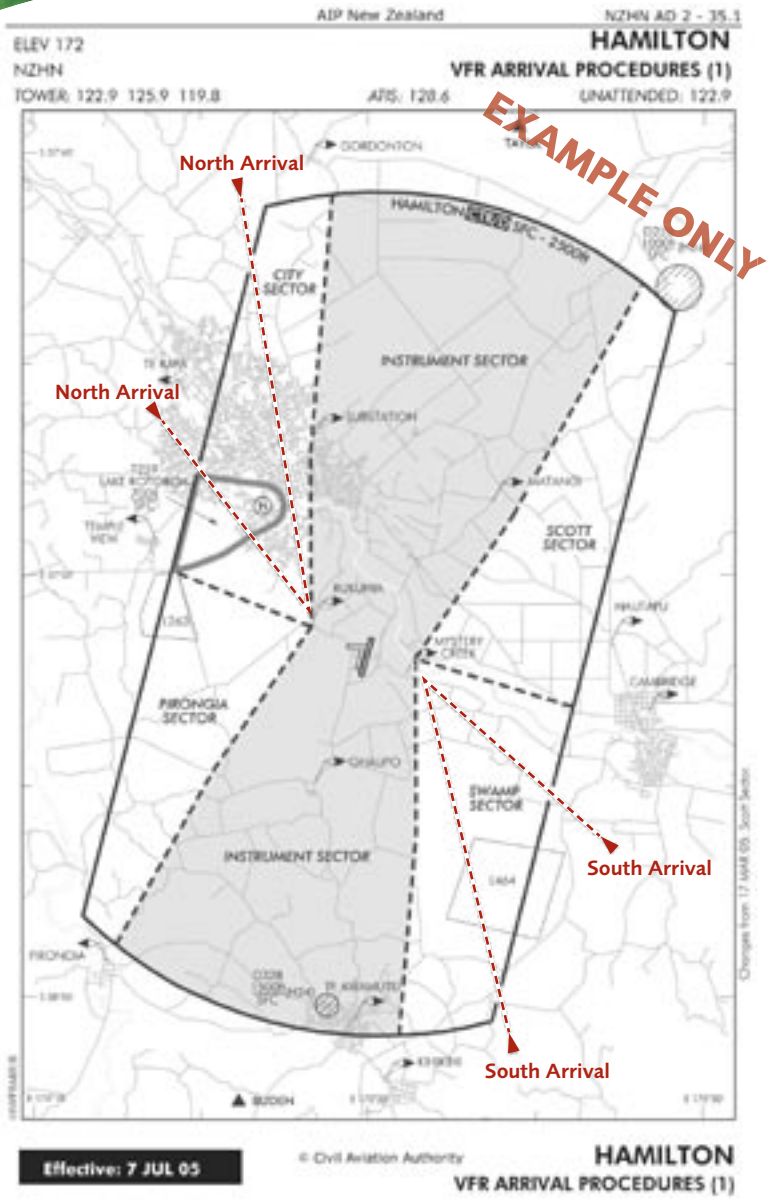
Hamilton aerodrome has become busier during recent months, with increased VFR activity. As a result, changes have been made to the control zone sectors, and VFR arrival and departure procedures have been introduced. These amendments are promulgated in the *AIP Supplement,* numbers 78-80/05, effective 7 July. It is recommended that pilots become familiar with these procedures to ensure safe operations at Hamilton. If you are unfamiliar with this supplement, it is available free on the *AIP New Zealand* web site, www.aip.net.nz.

This article outlines the airspace changes that are detailed in the *AIP Supplement*, and it discusses some important weather considerations when flying into Hamilton. It is important that information in this article is augmented by referring to the *AIP Supplement*, checking current NOTAMs, and checking weather information for the latest conditions at Hamilton.

## Airspace Changes

Major airspace changes have been implemented within the Hamilton Control Zone (CTR/D). The West and East sectors have been replaced with the City Sector, Pirongia Sector, Scott Sector, and the Swamp Sector. These sectors are associated with the establishment of published VFR arrival and departure procedures to assist in the safe transit of VFR aircraft during busy traffic periods.

During times of lower activity, these procedures may not necessarily apply – alternative arrival and departure procedures may be issued, traffic permitting.



## Arrival Procedures

For VFR flights entering the Hamilton CTR/D and landing, listen to the ATIS (128.6 MHz) for conditions at Hamilton aerodrome. Contact Hamilton Tower (122.9 MHz) advising receipt of ATIS, with QNH.

It is good aviation practice – and will assist in traffic sequencing – to request a clearance into the CTR/D at least 5 NM before the control zone. During busy periods, VFR aircraft are required to enter the CTR/D through the City or Swamp Sector. During quieter traffic periods, you may be offered alternative clearances.

If you are arriving from the north or west, position for a North Arrival. When cleared, enter the CTR/D via the City Sector (overhead Hamilton City) at 1700 feet. Report approaching 2 NM from Rukuhia. You may be required to hold west of Rukuhia maintaining 1700 feet. If you have been issued with a specific runway arrival, continue at 1700 feet to either join lefthand downwind for runway 36, or track overhead the Tower and turn left to join downwind for the designated runway (08, 26 or 18). Maintain 1700 feet until advised by the Tower. If you are not cleared to descend, maintain 1700 feet and continue in the circuit pattern until a descent can be issued. After being issued with a runway arrival, you may be required to switch to 125.9 MHz to join the circuit. Change to this frequency only when instructed by Hamilton Tower.

*Te Rapa on the edge of the Hamilton Control Zone, looking southeast over Hamilton City.*

*The Substation reporting point, located inside the City Sector of the Hamilton Control Zone.*

If you are arriving from the south or east, position for a South Arrival. When cleared, enter through the Swamp Sector at 1700 feet. Report approaching 2 NM from Mystery Creek. You may be required to hold east of Mystery Creek maintaining 1700 feet. If you have been issued with a specific runway arrival, join lefthand downwind for either runway 08 or 18, maintaining 1700 feet until advised by the Tower. Otherwise track overhead the Tower, turn left and join lefthand downwind for either runway 26 or 36, maintaining 1700 feet until advised by the Tower. If you are not cleared to descend, maintain 1700 feet and continue in the circuit pattern until a descent can be issued. After being issued with a runway arrival, you may be required to switch to 125.9 MHz. Change to this frequency only when instructed by Hamilton Tower.

*Mystery Creek reporting point, to the east of Hamilton aerodrome.*

In the event of a communications failure outside the Hamilton CTR/D, remain clear and proceed to an alternative aerodrome. Remember to squawk 7600. If you have a communications failure within the CTR/D and a **specific runway arrival has been issued,** follow the assigned clearance and instructions, squawk 7600, look for lights from the Tower (refer to *AIP New Zealand, Vol 4*, AD Table 1.9-1 for information on visual signals). If a specific runway has not been issued, leave the CTR/D via a reversal of your assigned clearance and instructions, squawk 7600 and proceed to an alternative aerodrome. If you are unable to do that, squawk 7700.

## Departure Procedures

When departing, listen to the ATIS (128.6 MHz) for conditions at Hamilton aerodrome. Contact Hamilton Tower on 122.9 MHz for initial departure/taxi clearance, advising your position on the aerodrome, flight details, and receipt of the ATIS (with QNH). You may be required to change to 125.9 MHz – change only when instructed by Hamilton Tower. Unless otherwise cleared, follow the published circuit rules and direction for the departure runway, then leave the circuit onto the cleared procedure by climbing straight ahead, or via crosswind, downwind or base leg. When clear of the circuit, if operating on 125.9 MHz, change to and listen out on 122.9 MHz.

If you are cleared to depart via the City or Swamp Departure, track via the specified sector maintaining 1200 feet or below. If you are cleared via the Pirongia or Scott Departure, depart at

*Continued over ...*

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1200 feet or below until established in the specified sector, then continue at 2500 feet or below. It is important when vacating through the City or Swamp Sectors to remain 1200 feet or below (weather permitting) for separation, as arriving aircraft will be at 1700 feet.

In the event of a communication failure, vacate the CTR/D via the assigned procedure or instructions, and squawk 7600.

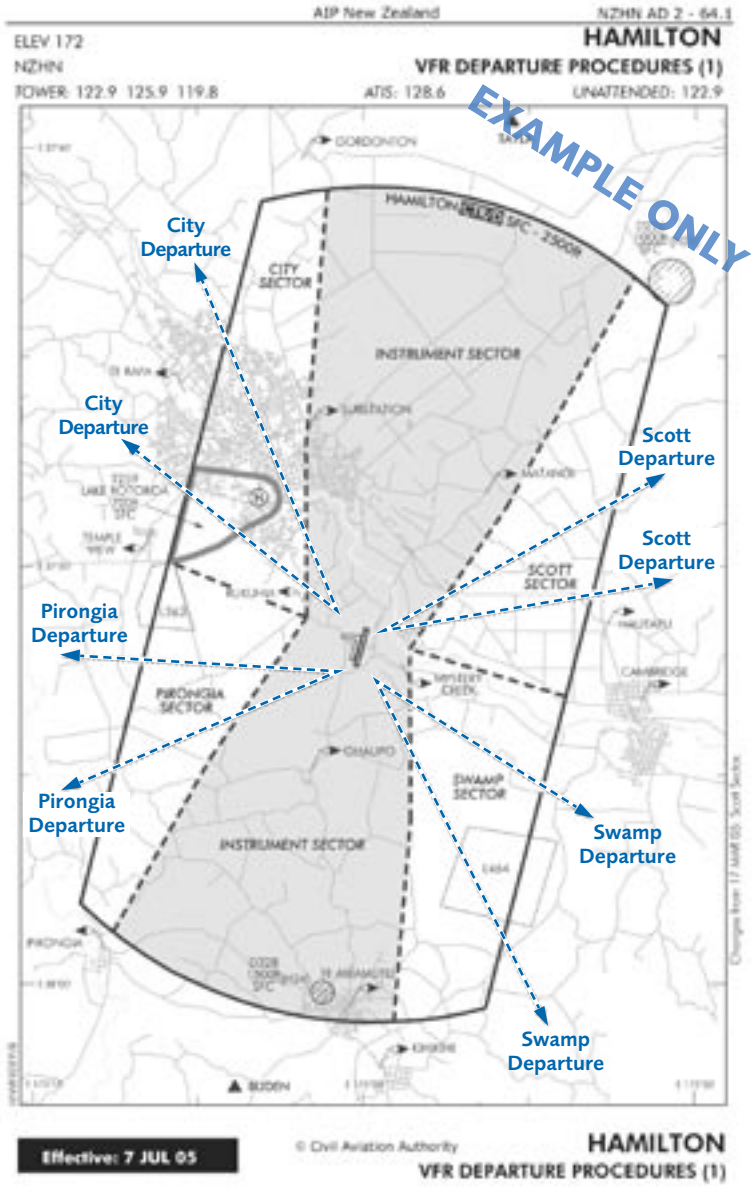
## General

Be aware that the routing and altitude instructions may be varied by Hamilton Tower – this will depend on the traffic patterns and weather conditions at the time. For example, during quiet traffic periods, it may be possible to arrive through the Scott or Pirongia Sectors. If you are unable to conform to any ATC instruction or clearance, then notify ATC.

Immediately to the west and east of the control zone, be on the lookout for training aircraft, especially around the Cambridge, Lake Karapiro, and Temple View areas.

*Cambridge looking west towards Hamilton aerodrome.*

*Temple View reporting point looking west.*




When departing or arriving from Hamilton aerodrome, exercise caution around the low flying zones in the Swamp and Pirongia Sectors and the danger areas (D226 and D328) on the fringes of the control zone. Be aware, when departing via the City Sector at 1200 feet, that helicopters may be operating in the Lake Rotoroa VFR transit lane (T259) beneath you.

If you are intending to arrive or depart within the control areas (CTA/D) around Hamilton be aware that these are controlled by Christchurch Control on 125.3 MHz.

If you wish to operate inside one of the sectors of the CTR/D, a clearance is required from Hamilton Tower (122.9 MHz) to change from one sector to the other. On the western side of the control zone, the boundary between the City and Pirongia Sectors is approximately a line between the Temple View and Rukuhia reporting points. On the eastern side, the boundary between the Swamp and Scott Sectors is approximately a line between the Mystery Creek and Cambridge reporting points.

Remember that the airspace at Hamilton is transponder mandatory (TM). Your transponder should always be set to ALT (Mode C) so that position and altitude information is transmitted to ATC, and to aircraft with TCAS. If your aircraft is not equipped with a serviceable transponder, then you must notify Hamilton Tower on first contact.

*Matangi reporting point.*

When departing from the circuit, try to vacate the instrument sector as soon as practicable, especially during busy IFR arrival and departure times.

## Weather

Hamilton aerodrome is reasonably well protected from frontal activity due to the surrounding hills and ranges. The inland location, near a number of water sources, does mean that fog is common. The following section provides a general description of weather at Hamilton aerodrome.

### Wind

The prevailing wind direction is between the southwest and northwest, but this does vary seasonally. For example, during autumn and winter there is no predominant wind direction. During spring and summer, westerly winds are common.

There are large diurnal variations in the surface wind at the aerodrome. During the night, and often throughout cloudy winter days, surface winds are very light or calm. In summer, during daytime, strong surface heating can result in stronger winds (typically west to southwest winds) occurring from mid-morning.

Under weak pressure gradients and clear skies during summer, thermal lows (localised areas of low pressure) can occur, and surface winds may be significantly different in strength and direction to upper-level winds around the Waikato area.

### Turbulence

Generally turbulent flying conditions can be experienced over the Waikato area in strong unstable westerly conditions with active cumulonimbus cloud development. For example, severe turbulence can be expected during strong southwesterly conditions on approach to grass runway 26. Moderate turbulence can also be expected when operating in the lee of Mount Pirongia and Mount Maungatautari.

In strong easterly winds, typically associated with warm fronts advancing from the north, considerable turbulence and lee-wave activity is generated by the Kaimai Ranges to the east of Hamilton.

### Cloud

Flying at Hamilton can be restricted by low stratus and fog, which can occur all year round (see May/June 2005 issue of *Vector*, page 4). Fog is typically widespread over the Waikato region but usually lifts to form low stratus before finally clearing in the late morning. If, however, a layer of stratocumulus cloud develops above the existing stratus or fog, it may delay the clearance until the afternoon.

Low stratus cloud forms in fronts approaching from the west, with preceding moist northerly winds. In this situation the cloud base is below that suitable for VFR flight. This situation can last for a few hours, depending on the speed of the front.

Prolonged periods of low cloud are usually associated with rainfalls in warm, moist northeast airflows associated with warm fronts advancing from the north of New Zealand.

Low stratus can also occur with a slow-moving anticyclone situated to the east of New Zealand. If this results in a north-northwest airflow over the North Island, widespread low cloud and drizzle, which can persist for several days, occurs over western areas.

### Visibility

Hamilton skies can become hazy, especially under anticyclonic conditions. In this situation, pilots who are unfamiliar with the area may find it difficult to see Hamilton aerodrome, especially if approaching from the west or east. It is easier to see the aerodrome if approaching from the north or south.

### Precipitation

Substantial periods of rain occur with the advection of warm humid airstreams from the north. This is associated with nimbostratus cloud and low cloud bases, which are generally unsuitable for VFR flight.

During summer, isolated heavy afternoon showers or thunderstorms may occur from the development of thermal lows. In winter and spring, heavy convective showers can occur in west to southwest winds. Rain is more persistent about and in the lee of the coastal hills south of Raglan and Mount Pirongia.

## Summary

Hamilton has become busier. VFR pilots intending to fly into Hamilton aerodrome need to be familiar with the published arrival and departure procedures in the *AIP supplement*. The procedures are designed to facilitate safe navigation of the airspace for all users during peak traffic periods. It is recommended that you always obtain NOTAMs to check for any other changes. During periods of lower activity alternative routing and altitude instructions can be requested or will be provided from ATC.

It is important to obtain regular weather updates if flying into Hamilton because, if the weather is unsuitable for VFR flight, it is generally unsuitable throughout the Waikato region and there may not be alternative aerodromes available in the immediate area. The latest weather can be obtained from either the MetFlight GA web site, www.metra.co.nz/metflight, or the IFIS web site, www.ifis.airways.co.nz. These reports can be augmented by contacting the local operators for current weather conditions. ■

Photographs courtesy of the Waikato Aero Club

# Helicopter Frost Protection

The year before last, CAA sent out a letter to many New Zealand helicopter pilots regarding helicopter frost protection operations. Last year we followed up with an article in *Vector* (September/October 2004 issue, pages 12 to 15) – and the frost largely stayed away.

This year we again draw attention to the hazards of frost protection flying at night. The CAA General Aviation Group's Rotary Unit will again be monitoring frost protection operations around the country.

What follows is a brief summary of the original article. We recommend you dig out your original copy and refresh your knowledge. (If you cannot get your hands on a copy, it is available on the CAA's web site, under "Safety Information" or request a copy from info@caa.govt.nz.)

## The Pilot and Operator

If an operation is for 'hire or reward', the pilot must hold a CPL (H), must have a local night authorisation, and needs to consider flight and duty times. The operator is responsible for ensuring that pilots flying frost protection operations within a control zone are familiar with the required procedures. This includes having copies of *AIP New Zealand* (or the relevant plates), charts, NOTAMs and current meteorological information.

If passengers, who are not crew members (or fall within the exceptions provided for in the Civil Aviation Rules, Part 1 *Definitions*), are carried on the helicopter, the operation is an Air Transport Operation, and the operator is required to hold a Part 119/135 Air Operator's Certificate. Also, if passengers are carried, the pilot requires night currency.

If a transit of more than 5 NM from a lighted heliport or aerodrome is necessary (not recommended for frost work), then the pilot requires recent instrument flight time (Civil Aviation Rules, Part 61 *Pilot Licences and Ratings*).

## The Aircraft and Equipment

A serviceable torch within easy reach of each crew member is required (a torch is no use to you if it is in your flight bag). All of the additional instruments required for night flying must be serviceable and illuminated.

When flying in controlled airspace, the aircraft must have a serviceable transponder. It is advisable to remove the hook mirror to reduce the possibility of reflection from the landing light.

## Before the Frost Season

Ideally, the grower and the helicopter operator should meet before the frost season starts. Discuss the following factors:

- The landing site, arrival and departure flightpaths should be well lit and clear of obstacles. A daylight reconnaissance flight may be prudent.
- The landing and fuelling area should be on site, minimising ferry times and reducing noise pollution.
- One person, on site, should be appointed responsible for all activities around the helicopter and helipad. This person should provide thorough briefings to all persons on site on safety around helicopters.
- The callout procedure. The pilot and support crew should, preferably, be accommodated on site.
- Neighbourhood issues. Discuss noise abatement procedures and the potential impact on neighbours.

## Urgent Callout

An operator may receive an urgent callout when frost conditions are forecast. The operator should have a written procedure for handling the situation. **Do not compromise personal or company minimums to meet what someone else considers to be an 'emergency'.**

*Allow sufficient time to fly the helicopter to the site before ECT.*

## On the Night

After arriving on site, review the hazard plan and operational requirements with the grower. When the frost alarm has been raised, avoid being rushed by a stressed grower. It is important to allow time for dark adaptation – at least five minutes or longer after leaving brightly lit areas.

After startup, the pilot needs to consider the following:

- outside air temperature gauge operational
- condensation on the windscreen has dried off
- visual illusions, in particular judgement of distance
- moonlight
- communication with other helicopters and ground operations
- the inversion layer and its effects on operations
- fatigue
- obstructions (lighted and unlighted)
- immediate action in the event of an engine failure
- procedure (planned in advance) if:
  - inadvertently entering IMC, or
  - losing visual contact with the ground.

## Noise

The CAA receives complaints from the public regarding helicopter noise generated by night frost protection operations. The number of complaints can be reduced by having the helicopter arrive on site before nightfall. Discuss with the client issues of notification of frost operations to neighbouring properties.

## Conclusion

As we said at the beginning, this article does not repeat all the content of the original, which was published in *Vector*, September/October 2004. If you're contemplating night frost protection operations, we suggest you get hold of a copy. ■

## Frost Protection Operations at Blenheim

The Blenheim area has a large number of vineyards, and during the frost season it can be extremely busy, with over 30 helicopters operating at night. Most of these vineyards are located within the Woodbourne Control Zone (CTR/D). In previous years, Woodbourne Tower has reported problems with the seasonal influx of helicopters entering controlled airspace at dusk without prior warning. This presented difficulties for the duty controllers, and a number of airspace occurrences were filed.

This year, in order to facilitate smooth coordination of helicopter traffic, give Woodbourne Tower as much notice of your expected arrival as possible. It is recommended that you request a clearance at least 5 NM from the Woodbourne CTR/D. Have your transponder on with ALT selected (Mode C). In special circumstances, telephone and enter a flight detail, with the expected arrival time and destination. Ensure that you have the appropriate aerodrome charts and a current VNC, and that you are familiar with the procedures for operating inside the control zone (including the reporting points). If you are requesting a clearance into the CTR/D for Omaka, then ensure that you are familiar with the Omaka VFR arrival and departure procedures in the *AIP New Zealand, Vol 4,* AD Section.

If the frost operation begins in the early evening, and Woodbourne Tower is still on watch (check the latest *AIP supplement* for hours of service), try to facilitate your request to operate within the control zone by reference to the nearest Visual Reporting Point (VRP).

If Woodbourne Tower is off watch, the airspace is uncontrolled, but position reports with reference to the nearest VRP may be prudent to provide information to other aircraft in the area. At various times during the night, commercial aircraft may be arriving via the instrument approach. Maintain a listening watch on 122.8 MHz, and avoid operating near the final approach path.

When making a position report, remember that the Wairau valley is oriented approximately **east to west**. If you are unsure about your bearing from a VRP, then monitoring the compass or the directional indicator may assist in maintaining awareness of your position.

After the frost operation, to facilitate a smooth departure the next morning, before lifting off, obtain a clearance from Woodbourne Tower to vacate the CTR/D. If you are departing from Omaka, then refer to the *AIP New Zealand, Vol 4,* AD Section, for details on the departure procedures there.

For noise abatement, avoid overflying the built-up areas. This is particularly important if flying to Omaka to refuel. Good airmanship is required around the Omaka fuel facility, as it can be extremely busy.


*Woodbourne Control Zone*


This is an article in a series that considers recent aircraft accidents in New Zealand. The aim is to amplify the safety messages that can be derived from the accident. The official accident report can be found on the CAA web site*.

* www.caa.govt.nz, "Accidents & incidents – Fatal accident reports – 03/1355, ZK-JML"

## The Accident

It was a cold and windy afternoon in the Manawatu – fairly typical some might say! The pilot of JML, a Kolb microlight, flew from his base at Feilding on a short cross-country flight to Foxpine. After a stopover for a cup of tea, he got airborne for the return flight. Immediately after takeoff the aircraft clipped some trees and hit the ground inverted after turning through 180 degrees.

The pilot sustained fatal head injuries from striking an intercom box that had been attached to the structure just above the normal head position. He was not wearing a helmet. The accident investigation concluded that the aircraft had probably been flipped over by wind and turbulence before clipping the trees. The weather was such that it would be very difficult to retain control of a microlight in the prevailing conditions, particularly at an airfield like Foxpine, surrounded by trees.

*A pilot's view down runway 27 at Foxpine*

## The Weather

The pertinent parts of the forecasts or actual reports of the weather on the day were as follows (all times are local, NZST):

### North Island General Aviation Weather:

**Situation:** Strengthening westerlies over the lower North Island. A trough moves north over the west coast from this afternoon.

**Weather:** Kapiti, Manawatu. Scattered showers of rain becoming more frequent in the afternoon. A few heavy showers and thunderstorms in the south, moving north.

Visibility 30 km, reducing to 6000 m in showers, 4000 m in drizzle, and 2500 m in heavy showers.

Turbulence occasionally moderate, severe as per SIGMET.

### Forecast winds at Paraparaumu at 1700:

| | |
|---|---|
| 3000 feet | 290/36 knots |
| 5000 feet | 285/32 knots |
| 7000 feet | 275/27 knots |
| 9000 feet | 270/23 knots |

Winds forecast to increase in the afternoon.

### The forecast for Palmerston North for that day was:

| | |
|---|---|
| Wind | 330/15 gusting 25 knots |
| Visibility | 20 km reducing to 6000 m |
| Weather | Light showers |
| Cloud | FEW 2500 feet BKN 4500 feet |
| 2000-ft wind | 300/35 knots |

### The METARs for Palmerston North for the early afternoon contained the following winds:

| | |
|---|---|
| 1200 | 320/14 gusting 24 knots |
| 1300 | 310/17 gusting 28 knots |

### The forecast for Paraparaumu for that day was as follows:

| | |
|---|---|
| Wind | 320/18 gusting 30 knots |
| Visibility | 20 km reducing 6000 m |
| Weather | Light showers |
| Cloud | SCT 2500 feet BKN 4000 feet |
| 2000-ft wind | 320/30 knots |

### METARs for Paraparaumu:

| | |
|---|---|
| 1200 | 330/16 gusting 25 knots |
| 1300 | 320/19 gusting 33 knots |

The METARs show that the forecasts were very accurate. Foxpine is about halfway between Palmerston North and Paraparaumu, so we can expect that the conditions there were about the same, though terrain effects may have modified the winds a bit. Either way, it was not a good day to be flying any sort of light aircraft.

The pilot was very experienced on type, and he had flown in and out of Foxpine on many occasions. He was well known for his habit of flying in virtually any weather conditions.

## The Lessons

Do not attempt to fly in weather conditions that are not suitable for the aircraft type. This pilot had got away with it over a long period, but eventually had run into conditions that were outside the controllability envelope of the aircraft. The weather in this case was well forecast, and it is noteworthy that the accident pilot was the only one airborne in that area that day.

If appropriate, wear a helmet.

# Is Your Transponder Airworthy?

***Greg Atkins of Airways New Zealand has raised an issue about transponders which has become apparent during their radar modernisation project.***

Airways New Zealand is presently undertaking a major upgrade of the Secondary Surveillance Radar (SSR) radar system used to interrogate transponders and display accurate data for Air Traffic Controllers. The new equipment will also be capable of interrogating the latest type of Mode S (selective) transponders.

SSR Mode S implies that the radar interrogations are 'selective' rather than the current 'broadcast' mode A and mode C interrogations. The advantages of mode S are:

- Reduction in garbling of transponder replies, since a single reply will be received for each unique interrogation. Equally this means a reduction in unnecessary replies, leading to greater efficiencies.
- Use of longer reply messages, enabling the downloading of data from suitably-equipped aircraft. This is called 'enhanced surveillance' and will be introduced gradually. One example is reception of ACAS 'resolution advisories'.
- Eliminates pilot having to select a discrete code, and the radar controller having to manually enter the aircraft identification.

*AIP Supplement* 15/05 has information on the radar modernisation programme, including the likely impact on flying operations and the proposed schedule of work. There will be some limitations in coverage throughout the country at various times over the next year as the programme advances and various radar sites are switched off while they are upgraded. Actual dates for radar site outages are advised by NOTAM with as much notice as possible, along with any operational restrictions that will apply for that particular period.

During April and May, work was undertaken on a radar site that provides the major coverage for the Manawatu area. During the testing process it became apparent that certain brands of transponders are not reacting correctly to the interrogation process and are not being seen by radar. These transponders will probably not be seen by TCAS-equipped aircraft either.

Further investigation has revealed that these affected transponders had not been modified as mandated by CAA through the Airworthiness Directive process.

The following transponders are subject to the Airworthiness Directives (AD) shown:

- Bendix King KT76A – DCA/RAD/10
- Rockwell Collins 621A3 – DCA/RAD/18
- Narco AT150 – DCA/RAD/24
- Terra TRT 250 – DCA/RAD/25 (the Terra is a popular type in homebuilts, microlights and gliders)
- Garmin GTX33, GTX 33D, GTX 330 and GTX330D – DCA/RAD/28 (software upgrade)

These ADs were issued between 1998 and 2005, with compliance dates ranging from 31 July 1999 to 26 November 2005.

If your aircraft has an unmodified transponder, please ensure that it is rectified before your next flight. Aircraft are not permitted to enter transponder mandatory airspace without a fully-operative transponder, unless specifically approved by ATC.

In addition, a small number of compliant but faulty transponders have been identified by exhibiting poor performance when interrogated by the new radar. It seems the older radar was more tolerant of transponders operating outside their specification, but that is not the case with the new radar. Airways will endeavour to contact the operators of these aircraft so that they can have their transponder checked and re-calibrated.

## Checking ADs

An *Airworthiness Directive* (AD) is a mandatory airworthiness requirement issued by the Director of Civil Aviation under section 72I (3A) of the Civil Aviation Act. (The process for issuing ADs is set out in Civil Aviation Rules, Part 39 *Airworthiness Directives*). ADs specify modifications, inspections, conditions, or limitations to be applied to an aircraft or aeronautical product to ensure continued safe operating conditions.

It is the operator's responsibility to check that any ADs issued for their aircraft and its associated equipment are actioned by the due date.

Some operators may (quite wrongly) be relying on their engineer for all aspects of maintenance, but the responsibility for maintenance requirements sits squarely on the shoulders of the operator. Rule 91.603 *General maintenance requirements* specifies that the operator shall ensure that the aircraft is maintained in an airworthy condition, that applicable airworthiness directives are complied with, and that appropriate inspections are made. The LAME may carry out the work, but it is the operator's responsibility to ensure it is done.

The annual and 100-hour inspections and the annual review of airworthiness may all occur at the same time for aircraft flying less than 100 hours per year. Inspection and testing of avionics and some instruments (including the transponder) is required at 2-yearly intervals (Civil Aviation Rules, Part 43 *General Maintenance Rules*).

It is not good enough, however, to wait until these inspections occur and to rely on the certifying engineer to discover any overdue ADs. You could already be in breach of CAA rules – and be compromising safety.

Airworthiness directives are issued **to ensure continued safe operating conditions**, and it is in the operator's interest to ensure that they are complied with (ADs are mandatory).

There is an easy way to check for any ADs for your aircraft and its equipment. All ADs are listed on the CAA's web site, www.caa.govt.nz under "Rules & more – Supporting Information – Airworthiness Directives (ADs)". There is a consolidated list of ADs issued and amended in the last 15 months to assist with an initial check.

Owners and operators should be checking the monthly AD Amendment Schedule to ensure that their aircraft is in compliance with all relevant ADs. The easiest way of doing this is to subscribe to the free notification service on the CAA web site under "Rules & more – notification service".

# More On Visual Approaches

## Corrections

In our previous issue, *Vector* May/June 2005, page 16, we gave some erroneous advice in the article "Visual Approaches", which dealt with visual approach procedures for IFR flights. We apologise for the errors. Thank you to the air traffic controllers and other readers who pointed out the errors and offered further useful information.

When detailing the conditions required for a visual approach in controlled airspace we stated that, by day, the pilot-in-command must have the aerodrome in sight before requesting a visual approach. **This is not correct;** the pilot must only be able to maintain visual reference to the terrain. For a visual approach at night, however, it is essential that the pilot has the runway lights in sight. Sighting only the aerodrome beacon, runway end identifier lights, or approach lights is insufficient.

We stated that the pilot must, at all times, have the preceding aircraft in sight on a visual approach. **This is not correct;** it depends on the circumstances. The air traffic controller can provide separation between aircraft, usually by radar, geographical, or visual separation depending on the destination aerodrome. For visual separation, the pilot will be informed of the aircraft that they are following and be given traffic information to assist with sighting the traffic. If the pilot reports that they have the aircraft in sight, they may be instructed to follow that aircraft. In this situation, the responsibility for separation moves from the controller to the pilot. If the pilot at any stage loses sight of the other aircraft, or has doubt about the ability to follow, they should immediately inform ATC so that some other form of separation can be put in place.

Note that in a traffic situation where there is the possibility of misidentifying the preceding aircraft (particularly at night), then ATC may not be able to accommodate a request for a visual approach.

We stated that the visual approach must comply with rule 91.311 *Minimum heights for VFR flight*, or Part 93 *Special Aerodrome Traffic Rules and Noise Abatement Procedures*. **This is not correct;** an IFR aircraft on a visual approach remains an IFR flight, unless the pilot cancels IFR and continues VFR.

## Further Information

A visual approach must be requested by the pilot stating "Request Visual Approach" (*AIP New Zealand* ENR 1.5 para 4.22). It is incorrect terminology to just use the term "Visual" when requesting a visual approach. If a visual approach is approved the aircraft remains an IFR flight.

*AIP New Zealand* ENR 1.5 para 4.22 states that IFR flights may be cleared to carry out a visual approach (or, at selected locations, by day only, may be cleared to carry out a *visual arrival procedure* – see below), provided that:

- the reported ceiling is not below the approved initial approach level for the aircraft so cleared; or
- the pilot reports at the initial approach level, or at any time during the instrument approach procedure, that the meteorological conditions will permit a visual approach, and that there is a reasonable assurance that the landing can be accomplished.

When cleared by ATC for a visual approach, further descent is normally unrestricted. In some situations, however, an altitude restriction or requirement may be included in the clearance or a subsequent clearance. If an altitude restriction occurs that may influence your ability to maintain visual reference to the terrain on the visual approach, then it is safer to proceed with the instrument approach until the meteorological conditions are more appropriate.

During daylight hours, ATC may advise (or the ATIS may broadcast) that a visual approach is the preferred IFR approach. It remains, however, the pilot's prerogative to request the visual approach. If the pilot wants to fly an instrument approach, it is advisable on first contact with the approach controller to request the type of instrument approach.

At night ATC cannot nominate a visual approach as the preferred approach. (The exception is for Christchurch Runway 11/29, when there is no reported cloud below 5000 feet and the visibility is at least 16 km.) If the meteorological conditions are assessed as appropriate by the pilot for a visual approach, then it is advisable to inform the approach controller on first contact to facilitate the arrival sequencing.

To fly to an aerodrome that does not have a published instrument approach, it may be possible to fly the instrument approach at a nearby aerodrome and then proceed **VFR** to the destination aerodrome. If your destination is Ardmore, for example, *AIP New Zealand* states that (non-GPS) aircraft can make an appropriate instrument approach at Auckland then proceed VFR to Ardmore. Note that in this situation, you can not request a visual approach for Ardmore.

Christchurch and Wellington aerodromes have published *visual arrival procedures*. A visual arrival procedure is in essence a visual approach – the only difference is that the tracking, altitude and distance requirements are specified in *AIP New Zealand* instead of the air traffic controller having to detail them. Pilots, however, should always use the words "request visual approach".

At Wellington or Christchurch, depending upon the circumstances, they may be cleared for either a visual approach or a visual arrival procedure.

There is some misconception that requesting a visual approach will elevate the aircraft's position in the arrival sequence. Only occasionally will this be the case. Normally, an arrival sequence has been set before the pilot calls the approach controller, and only in light traffic situations will a visual approach make any difference to the arrival sequence.

Remember that being cleared for a visual approach, or a visual arrival procedure, requires the pilot to navigate by visual reference. To provide separation, ATC may require the pilot to fly via reference to visual reporting points; therefore, it is a good idea to carry a current VNC. If a pilot is unfamiliar with the visual reporting points, a visual approach may not be a good option, and it is advisable to carry out an instrument approach procedure.

On instrument approaches other than a visual approach, ATC is responsible for maintaining wake turbulence separation. Normally this is 5 NM. Aircraft on a visual approach that are visually following another aircraft are required to provide **their own** wake turbulence separation from the aircraft in front.

It is good aviation practice to prepare for an instrument approach, including setting up the required navigational aids for a missed approach; if the meteorological conditions are assessed as suitable, then a visual approach can be requested. If there is any doubt, it is safer to continue with the instrument approach. It is recommended, therefore, not to commit to a visual approach too early, and to ensure that a continuous visual reference to recognisable terrain leading to the aerodrome is achievable.

## Summary

An aircraft on a visual approach remains an IFR flight. An IFR flight may be cleared for a visual approach **by day or night**, or a visual arrival procedure by **day only**, provided that the pilot requests a visual approach, and the meteorological and traffic conditions permit. ■

## Revised GAP Booklet – *Winter Flying*

The *Winter Flying* GAP booklet has been revised and updated. To obtain copies, contact either your local Field Safety Adviser (see the advertisement in *Vector* for contact details) or the Communications and Safety Education Unit.

Tel: 0–4–560 9400

Email: info@caa.govt.nz


# Aviation Safety Coordinator Training Courses

## Attention all aviation organisations

Three Aviation Safety Coordinator (ASC) training courses are planned for September 2005. These two-day courses will be held in Auckland 8 and 9 September, Palmerston North 15 and 16 September, and Christchurch 22 and 23 September (see details below).

An Aviation Safety Coordinator runs the safety programme in an organisation. Your organisation should have a properly administered and active safety programme.

If you are involved in commuter services, general aviation scenic operations, flight training, or sport aviation, this course is relevant for your organisation. You may have had an ASC trained in the past who is now due for a refresher, or personnel changes may mean a new person should be trained. As well as the course content, you will receive a comprehensive manual, which you could adapt to suit your operation.

There is no course fee. The cost of meals (except lunch), accommodation and transport is your responsibility.

**Recommendation from a course participant:**

> *"Having attended an earlier Aviation Safety Coordinator course, I can thoroughly recommend the course, which contributed significantly to our Company's overall safety programme. It was a great forum for the exchange of views and ideas amongst operators. We have certainly appreciated and benefited from the presentations and the safety manual structure developed in the course."*
>
> **Richard Rayward, Managing Director, Air Safaris and Services NZ Ltd**

Check the CAA web site, www.caa.govt.nz, for an enrolment form and further information. This can be found by selecting "Safety Information – Seminars and Courses". Alternatively you can receive an enrolment form by contacting Rose Wood, Tel: 0–4–560 9487, Fax: 0–4–569 2024, Email: woodr@caa.govt.nz.

### ASC Course Venues

**Auckland – Thu 8 and Fri 9 September**
Centra Auckland Airport Hotel,
Cnr Kirkbride & Ascot Roads, Mangere

**Palmerston North – Thu 15 and Fri 16 September**
Sherwood Motor Inn, 250 Featherston St

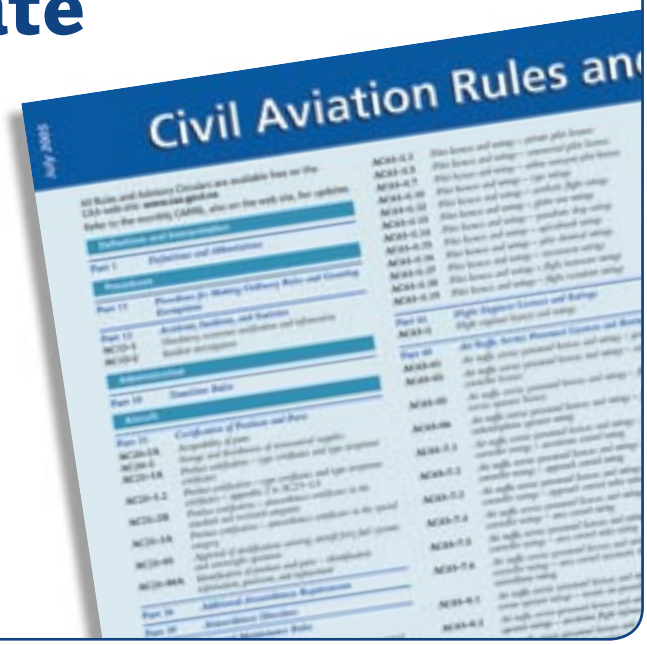
**Christchurch – Thu 22 and Fri 23 September**
Commodore Airport Hotel, 449 Memorial Avenue

# Rules Poster Update

Enclosed in this issue of *Vector/CAA News* is an updated Current Rules and Advisory Circulars poster. The most up-to-date information on Rules will always be on the CAA web site, www.caa.govt.nz, but this poster is useful to have on the office or briefing room wall. Make sure you replace old versions with this updated one – the colour is different to make updating easier.

On the web site you can find all current Rules, Advisory Circulars, and NPRMs. The most useful publication for regularly updated information on the Rules is the CARRIL (Civil Aviation Rules Register Information Leaflet). It is published on the web site monthly, generally on the first Thursday of every month, with special editions when required.

You can subscribe to our email notification service to be advised when the CARRIL is published. On the "Rules & more" page, see "FREE Notification Service". This service can also be used to receive updates on Rules changes, NPRMs, etc.





## Revised Poster –
# Release To Service

The poster "Release To Service – checks before signing" has been updated and reprinted in A3 size. This poster is designed as a quick reference checklist that reminds LAMEs of the documentation requirements when completing a release-to-service certification. It can be put up in the hangar or in a location where this process is completed. To obtain copies, contact either your local Field Safety Adviser (see the advertisement in *Vector* for contact details) or the Communications and Safety Education Unit.

Tel: 0–4–560 9400 • Email: info@caa.govt.nz

# Field Safety Advisers

**Don Waters**
(North Island, north of line, and including, New Plymouth-Taupo-East Cape)
Tel: 0–7–823 7471
Fax: 0–7–823 7481
Mobile: 027–485 2096
Email: watersd@caa.govt.nz

**Ross St George**
(North Island, south of line New Plymouth–Taupo–East Cape)
Tel: 0–6–353 7443
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Mobile: 027–485 2097
Email: stgeorger@caa.govt.nz

**Murray Fowler**
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Email: fowlerm@caa.govt.nz

**Owen Walker**
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**Bob Jelley**
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Fax: 0–3–322 6379
Mobile: 027–285 2022
Email: jelleyb@caa.govt.nz

## 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".*

## Aviation Safety Concerns

*A monitored toll-free telephone system during normal office hours. A voicemail message service outside office hours.*

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

*For all aviation-related safety concerns*

# 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 now 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, 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-SPK, Micro Aviation B22J Bantam, 25 Dec 02 at 15:25, 2 SW Thames Ad. 2 POB, injuries 2 fatal, aircraft destroyed. Nature of flight, private other. Pilot CAA licence nil, age 46 yrs, flying hours 200 total, 185 on type, 27 in last 90 days.**

The microlight aircraft was on a local flight over the Thames area, when it was seen to suddenly roll to the left and steeply descend to the ground. Shortly thereafter, the wreckage of the aircraft was found by a local farmer. The pilot and passenger did not survive the accident. A full accident report is available on the CAA web site.

Main sources of information: CAA field investigation.

CAA Occurrence Ref 02/3746

**ZK-JLP, Zenair Zenith CH-200, 28 Dec 02 at 10:55, nr Matakana Island. 2 POB, injuries 2 fatal, aircraft destroyed. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 73 yrs, flying hours 465 total, 31 on type, 0 in last 90 days.**

The aircraft crashed into the sea off Matakana Island. Early in the flight, the nosewheel steering lock either disengaged or failed to engage. While attempting to re-engage the steering lock, the pilot lost control at an altitude too low to permit a recovery. A full accident report is available on the CAA web site.

Main sources of information: CAA field investigation.

CAA Occurrence Ref 02/3747

**ZK-DGS, Piper PA-23-250, 9 Jan 04 at 19:15, Paraparaumu Ad. 2 POB, injuries nil, damage substantial. Nature of flight, freight only. Pilot CAA licence CPL (Aeroplane), age 24 yrs, flying hours 1785 total, 850 on type.**

On Friday 9 January 2004 at about 1915, ZK-DGS, a Piper PA23-250E Aztec, landed at Paraparaumu Aerodrome. The aircraft taxied to the fuel pumps, and as it was coming to a stop the right main landing gear collapsed rearwards. The two pilots on board were uninjured. The main landing gear drag brace forward attachment bolt failed because of fatigue, possibly from stress caused by out of round bushings in the drag brace. The aircraft had been rebuilt following serious accident damage in 1995. These components were possibly re-used during this rebuild, and stress initiators might have been created during the accident that then led to the bolt eventually failing.

Main sources of information: Abstract from TAIC Accident Report 04-001.

CAA Occurrence Ref 04/33

**ZK-GTF, Schleicher ASH 25, 20 Feb 04 at 16:35, Tekapo. 2 POB, injuries nil, damage substantial. Nature of flight, training dual. Pilot CAA licence CPL (Glider), age 57 yrs, flying hours 3050 total, 187 on type, 261 in last 90 days.**

During a cross-country training flight an outlanding became necessary. The instructor noted a crosswind during the circuit but did not notice the tailwind component. On landing the left wing contacted the ground, resulting in a groundloop. The glider sustained substantial fuselage damage.

Main sources of information: Accident details submitted by operator.

CAA Occurrence Ref 04/769

**ZK-HZH, Robinson R22 Beta, 14 May 04 at 11:00, Hurunui. 1 POB, injuries nil, damage substantial. Nature of flight, training solo. Pilot CAA licence PPL (Helicopter), age 33 yrs, flying hours 618 total, 240 on type, 76 in last 90 days.**

It was reported that after takeoff, on a solo spraying sortie, the helicopter's rotor rpm decreased. The pilot attempted to jettison the spray load and turned the helicopter for a landing.

*Continued over ...*

... continued from previous page

The pilot, however, undershot the approach to the elevated landing site, and the tail rotor struck the uneven ground. The accident was possibly caused by the spray tank, which reportedly failed to jettison its load. This caused the pilot to misjudge his approach and suffer the heavy landing.

Main sources of information: Accident details submitted by pilot and instructor.

CAA Occurrence Ref 04/1625

**ZK-FNX, Cessna A185E, 29 Jul 04 at 18:49, Timaru. 1 POB, injuries 1 minor, aircraft destroyed. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 44 yrs, flying hours 4100 total, 1840 on type, 70 in last 90 days.**

The aircraft took off from Timaru airfield after uplifting a small amount of fuel. The aircraft headed out to the coast and then flew up the coastline towards Ashburton at about 700 to 800 feet. When near overhead the Opihi River, the engine gave a surge and stopped. A righthand turn was carried out over the sea to face the aircraft into wind. A successful ditching was carried out, and the pilot was able to swim to shore. The aircraft was not recovered, and no wreckage has been found. The cause of the engine failure could not be determined.

Main sources of information: Accident details submitted by Rescue Coordination Centre.

CAA Occurrence Ref 04/2382

**ZK-IVC, Robinson R44 II, 25 Sep 04 at 11:45, Glenorchy. 1 POB, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Helicopter), age 54 yrs, flying hours 488 total, 145 on type, 46 in last 90 days.**

It was reported that the helicopter experienced a hard landing. The landing skid collapsed and the helicopter tipped over, causing substantial damage. The hard landing was caused by the pilot inadvertently hitting the hydraulic boost switch when aiming for the load release button. The design of this system is now being reconsidered by the FAA.

Main sources of information: Accident details submitted by pilot plus CAA engineering investigation.

CAA Occurrence Ref 04/3106

# GA Defect Incidents

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

## Aerospatiale AS 350B2
### Control system cable

The helicopter landed heavily after the tail rotor pedals jammed while in the hover. This is the second such incident to occur recently to a NZ registered AS350 helicopter. The binding tail rotor control cable has been the subject of the manufacturers Service Letters 137-67-97 and 1453-67-00 and major inspection requirement MET 05-29-00-601. As a result of these two incidents, the CAA have mandated the replacement of the cables with Airworthiness Directives DCA/AS350/79 and DCA/AS355/52. TTIS 4746 hours.

ATA 6720

CAA Occurrence Ref 04/1041

## Aerospatiale AS 350BA
### Winch cable

While conducting winch training, the cable was found to be unravelling, over a length of approximately 10 feet from the hook, when under a load of two 20-litre water-filled containers. The cable was considered serviceable, however, subject to a satisfactory check following each winch operation. When the winch was used again at a later date, the cable was declared unserviceable by the pilot due to further unravelling. The winch was sent to an overhaul facility for inspection and cable replacement. The hook bearing was found to be very 'notchy' and this could cause the cable to unravel when a full load is applied. Also, the hook when stripped was found to have corrosion on its thrust plate surface. The bearing and thrust plate were replaced and tested satisfactorily and a new cable was fitted.

The cable manufacturer identified potential contributing factors, such as:

- repeated no-load operation over short cable excursions
- binding hook bearings
- variation in cable manufacturing
- hoist operator awareness
- cable handling during maintenance.

TSI 16 hours, TSO 226 hours.

ATA 2550

CAA Occurrence Ref 04/573

## Aerospatiale AS 355F1
### Fuel flow lever

The operator reported that during the start-up, the fuel flow lever broke when it was placed in the start detent. The engine was shut down using the fuel shutoff lever. Engineering replaced the fuel flow lever and also found the number two fuel flow lever cracked. As a preventive action, the maintenance inspection sheets were amended to include a detailed inspection of the part, and in addition the part was placed on a 2000-hour life. TSI 70 hours, TSO 16268 hours, TTIS 16268 hours.

ATA 7610

CAA Occurrence Ref 04/2087

## Gippsland GA200
### Rudder cable

It was reported that during a 100-hour inspection, the lefthand rudder cable was found to be almost completely severed due to chafing where it passes through the mid-fuselage fairlead. This area would be visible during scheduled inspections, particularly after removal of the top fuselage access panel. This defect highlights the need to maintain vigilance when carrying out general zonal and flight control cable inspections. TSI 100 hours.

ATA 2720 CAA Occurrence Ref 04/3251

## KHI Kawasaki-Hughes 369HS
### Compressor case lining

An unusual engine noise was heard when the helicopter arrived for maintenance. The operating temperature at idle power was considered to be approximately 60 degrees higher than normal. It was not considered safe to carry out a power check. The noise resulted from excessive degradation of the compressor case plastic lining. Replacement compressor case halves were fitted after inspecting the engine for other damage. Performance checks satisfactory.

ATA 7230 CAA Occurrence Ref 04/3617

## North American Harvard 3*
### Fuel contents

The operator reported that during the pre-flight inspection, considerable discoloration was noted in a fuel sample taken from one of the aircraft fuel tanks. The sample was analysed by the Institute of Environmental Science and Research Limited, where it was determined that Potassium Chromate was present in the fuel. Investigation could not determine the cause of the contamination.

ATA 2800 CAA Occurrence Ref 04/1706

## NZ Aerospace FU24-950
### Horn trim tab

During pre-flight checking, the pilot noticed stiffness in the elevator control. After a few movements and small application of force, the stick moved freely and without further problem. On takeoff, however, the aircraft was found to be extremely nose heavy, so the pilot completed a circuit and landed safely. Investigation revealed the elevator trim rod to be bent and it was replaced. The cause was attributed to the aircraft becoming parked with the tail into wind as a result of a subsequent change in wind direction. Abrupt movements of the elevator and trim against the control stops resulted in the trim horn becoming bent. TTIS 11195 hours.

ATA 2732 CAA Occurrence Ref 03/3950

## Pacific Aerospace Cresco 08-600
### Outer panel attach fitting

It was reported that the rear spar outer panel attachment fitting on the centre wing was cracked at the bolt hole. The fitting was replaced. A metallurgical report indicated that the cracking was probably due to the attachment bolt being below the specified torque. The manufacturer has issued a Mandatory Service Bulletin requiring an initial inspection and then a periodic inspection. TSI 113 hours, TTIS 7862 hours.

ATA 5700 CAA Occurrence Ref 04/1484

## Partenavia P-68B
### Transfer tube blocked

The operator reported that during an engine failure simulation, the right propeller feathered for no apparent reason. The approach and landing was continued without further incident. Engineering removed the propeller and found that a build-up of sludge had occurred in the transfer tube. This was rectified and there have been no further occurrences.

ATA 6120 CAA Occurrence Ref 03/3096

## Partenavia P-68B
### Fuel sump

Fuel was found dripping from under the wing, around the fuel drain. The fuel tank sump had corrosion both inside and outside the sump, causing the leak.

ATA 2810 CAA Occurrence Ref 04/3339

## Piper PA-34-200T
### Turbo oil feed line

It was reported that during cruise flight the aircraft experienced a loss of oil pressure in the starboard engine. The engine was shut down and a safe landing completed. Investigation revealed that the main oil feed line to the turbocharger had become loose at the fitting to the non-return valve, allowing oil to be pumped overboard. TSI 25 hours, TSO 673 hours.

ATA 7920 CAA Occurrence Ref 04/3609

## Robinson R22 Beta
### Clutch actuator

The pilot reported that the clutch lights started to flicker during the approach. A loud bang was heard and the clutch light illuminated for seven seconds. A precautionary landing was carried out. An engineering inspection found the clutch actuator had over extended. The over extension and shaft/pulley misalignment caused the drive shaft to jump forward one groove and split the forward double 'V' belt.

An engineer, after troubleshooting previous clutch actuator problems, had recently replaced the designated 1 amp fuse in the circuit with a 2 amp fuse. This effectively removed the last line of defence against actuator over extension in the event of limit switch failure. One limit switch was found to be defective and the other was reported to be intermittent. TSI 1250 hours, TSO 1250 hours.

ATA 6300 CAA Occurrence Ref 03/3809

## Robinson R22 Mariner
### Drive train bearing

During the cruise the clutch light flickered intermittently. The drive train bearing (184-3) had spun on its outer race, causing damage to the bearing. The bearing was replaced.

ATA 6300 CAA Occurrence Ref 04/3677

## Zlin Z-37T
### Walter compressor casing

It was reported that, during a routine inspection, a crack approximately two inches long was found in the engine compressor case on the forward righthand side of the upper engine mount pad. The cause was not known, but the reporter suspects that it may have been initiated by a previous heavy landing. Engine removed and sent to manufacturer for repair. TSI 99 hours, TSO 498 hours, TTIS 1998 hours.

ATA 7230 CAA Occurrence Ref 04/2682