November/December 2015

POINTING TO SAFER AVIATION

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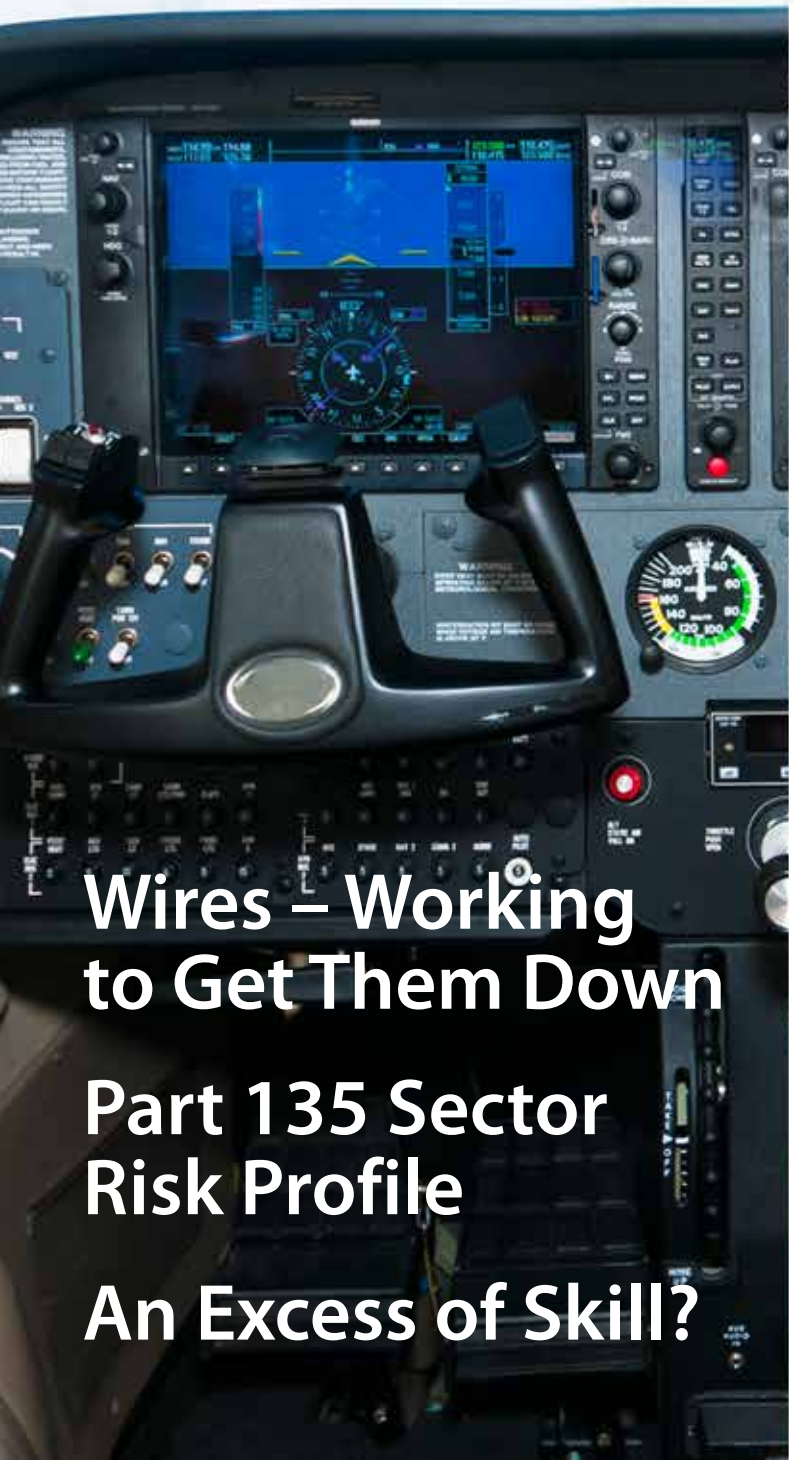
Glass vs Analogue



Wires – Working to Get Them Down

Part 135 Sector Risk Profile

An Excess of Skill?

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

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Glass vs Analogue

Once upon a time, pilots learned to fly in a cockpit that sported dials and gauges. Now, many fly aircraft with multiple screens and flashing colours. So isn't that progress? Where's the problem?

Over the last few years, aircraft with modern 'glass' cockpits (also referred to as Technically Enhanced Aircraft or TEAs) have arrived in New Zealand. Their features include computer-based instrument systems, GPS, and moving map displays.

Some pilots who trained on the older analogue cockpits are now having to get used to the glass cockpits.

And many of the 'Gen Y' pilots, who learned to fly on TEAs, are going on to fly analogue aircraft in the real world.

How has the changeover been for both types of pilots? And how can they prepare for it?

Old Dogs, New Tricks

For pilots who have trained on analogue aircraft, like CAA Aviation Examiner Marc Brogan, "the first danger in the glass cockpit is possible information overload. It can take some time getting used to".

Nelson Aviation College Chief Flying Instructor (CFI), Jeremy Anderson, found the glass cockpit the ideal place to become distracted. "It's easy to get consumed by all that equipment and information," he says.

Marc found it very helpful to de-clutter that information. "Use the option to reduce the number of displays and information, and change the way it is displayed."

Tony Downes, a CTC Aviation Flight Instructor, says that finding out where the information is, can be hard.

"For example, in an analogue cockpit, the altimeter is just one instrument. But in a glass cockpit, you have the display panel staring at you with all this information, and you have to find that one piece of information you need – where it is and what it's telling you.

"You can't rush it. Slow down and try not to scan everything at once. The glass cockpit is a complex system, and can do far more than what we need it to do. Not knowing the system properly can cause problems. What if you pushed the wrong button?

"Undergoing 'difference training' and practising on the ground really helps with all that."

CAA Aviation Safety Adviser, Carlton Campbell, notes another trap in the glass cockpit. "It is chasing the tape (following the tape numbers too closely as they change) with the consequent attitude fluctuations. It's all so different to following a needle – you can get too absorbed by all that information."

Tony Downes agrees. "The glass cockpit has super accurate systems – it will tell you if you are plus or minus 20 feet. So, new pilots can end up obsessing with that – at the expense of flying the aircraft.

"The other danger is that once you get comfortable, you get complacent, and blindly follow the machine. Or you just trust it without cross-checking against the current information both inside and outside the cockpit."

The CAA's Principal Aviation Examiner, Bill MacGregor, cautions pilots against the 'inside versus outside' scenario.

"You can easily end up focusing inside on the primary flight display (PFD), rather than on the outside making use of your

Continued over »

Photos: istockphoto.com/Alex Ciopata and Peter ten Broecke

Continued from previous page

usual references. You're getting information from the PFD, which is very good for situational awareness, but how about the real world? For example, what if you fly into cloud?"

Jeremy Anderson has a few tips. "The biggest thing is 'don't forget to look out the window'. That is what I always tell my students, and even other instructors. We tell each other to keep an eye out, and if anyone, including me, is getting too much into the cockpit and forgetting to look out, we remind each other."

Carlton Campbell agrees. "One has to be cautious that the priority balance doesn't get affected. This is 'eyes outside versus eyes inside', as the temptation to be referencing to those instruments is much more in an aircraft with a glass cockpit.

"Be prepared and aware that the electronic components may fail sometimes. In this situation, you need to smoothly move to backup equipment."

Jeremy Anderson warns, "We shouldn't expect to become experts straight away. Do the initial training on the glass cockpit *on the ground*. And make sure you pick a time when other stresses and workload are low."

> *"The threats are in their lack of currency and competency, irrespective of whether they fly a glass or analogue cockpit."*

Marc Brogan says pilots should stick to the basics, and remain current on secondary instruments.

"They are the older style ones and should the electronics fail, you need to know how to read them, as they are normally present even on newer aircraft."

New Dogs, Old Tricks

Lonic Harkness trained on Diamond DA40s and DA42s at Massey University, and until recently, was flying Beechcraft 1900D aircraft for Eagle Airways.

He found that it took a bit of time to get used to the older cockpit instrumentation.

"I was used to receiving lots of information from the system to aid my situational awareness.

"For example, wind velocity would be displayed on the PFD. It's great on a PFD because it's right there in front of you at all times. But it's a different story on the Beech, where you have to input values on the GPS to get an approximate indication of the wind.

"It really helped that I had to get a non-directional beacon (NDB) rating for my position with Eagle. The rating also served as an introductory lesson on the analogue system.

"What also helped was practice and currency on the older analogue system, and gaining a thorough understanding of it. I'm used to it now, and know how to interpret and use the information.

"You *can* find the same information on the analogue system – it just requires more thinking and information processing on your part."

Another pilot who went from new to old is Greg White, who now flies Cessna Caravans for Skydive Australia

From this...

Photo: david muscroft/shutterstock.com

in Cairns. He, too, learned how to fly on the Diamonds.

"It is the same information, just displayed differently. Of course, compared with the sophisticated equipment and information available in a glass cockpit, the analogue cockpit is a lot simpler but also less accurate.

"Before I flew the Caravan for skydiving ops, I completed my endorsement training. There, I had plenty of time to familiarise myself with where I would be getting the information from, and how to interpret the analogue instruments as accurately as I could.

"It helped that I did have some exposure to analogue cockpits, gained during my aerobatics training in an Alpha Robin.

"The biggest difference is that the situational awareness and information available in a glass cockpit far exceeds that of an analogue cockpit.

"Currency and familiarity on either system is extremely important, as are the basic flying skills."

CAA Aviation Examiner, John Parker, a 9000-hour pilot who trained on analogue instrumentation, is a complete fan of the glass cockpit.

"It's just so good, it's such a fantastic advance over analogue. The moving map is brilliant. Most systems are fitted with an autopilot. You know whether you're inside or outside controlled airspace."

But John, who is of the 'old school' also admits there's a danger in the dazzle of the glass cockpit.

"It's hard not to be seduced by it all. And I can see a problem in pilots simply kneejerk reacting to the blip in front of them, rather than checking its validity by looking at hard copy charts, or looking out the window."

John says today's student pilots do learn "the old way of flying".

"Our current theory exams are based on the old analogue instruments. So the students have the background theory about flying older aircraft to begin with. What they need is more practice flying them."

Current and Competent

Ardmore Flying School CFI, Warren Sattler, says that he's found younger students generally adapt well to the glass cockpit.

"After all, for them, the glass cockpit is just an extension of a computer game. But we always do a check ride when transferring from analogue to glass.

"The older generation hasn't grown up with this technology. But an older computer-literate pilot has a distinct advantage. By nature, they often expect a high standard of personal flying performance, and outcome.

"Age is certainly no bar. The oldest pilot that I am aware of converting to a G1000 cockpit was in his late 60s."

Carlton Campbell says that as far as the changeover goes, there seems to be more of a problem with people who are neither current nor fly often. "The threats are in their lack of currency and competency, irrespective of whether they fly a glass or analogue cockpit. Currency or competency with one instrument panel does not immediately translate to currency with the other."

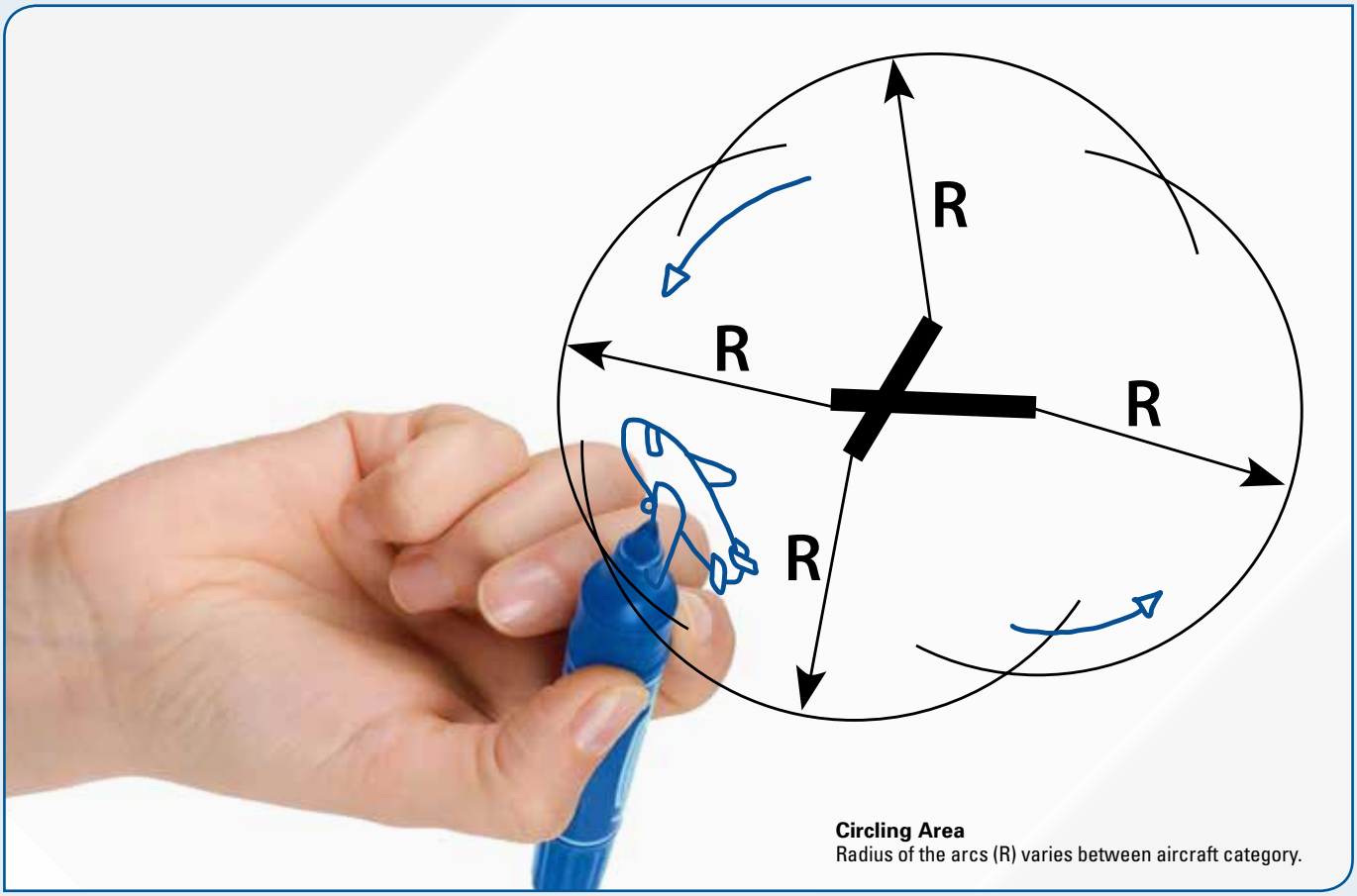
Marc Brogan sums it up.

"Whether you train on a new aircraft and end up flying an old one, or the other way round, it all comes down to being current and competent on the equipment or aircraft you are flying." ■

to this, the aircraft instrumentation panel has come a long way!

Photo: istockphoto.com/francv

IFR Circling
Speed Restrictions



Circling Area
Radius of the arcs (R) varies between aircraft category.

Photo: istockphoto.com/artproem

Some confusion exists in the IFR arena about circling speed restrictions and how they affect circling area dimensions. Pilots unaware of these nuances risk flying outside the protected area.

Visual manoeuvring (circling) is the term used to describe the phase of flight after an instrument approach has been completed. It brings the aircraft into position for landing on a runway which is not suitably located for a straight-in approach; when the runway doesn't meet the criteria for alignment, or the descent gradient cannot be met.

However, obstacles or prominent terrain within the vicinity of an aerodrome can complicate matters.

Where the procedure design organisation, and the CAA, determine that such hazards make the circling area MDA impractical, a maximum speed restriction may be imposed, relative to the performance category of the aircraft.

This speed reduction reduces the size of the circling radius, enabling a lower circling MDA and excluding any problematic terrain or obstacles from the circling area. Circling aircraft are protected by the procedure, provided they are above the circling MDA, and don't fly outside the reduced circling radius.

Reduced radius circling areas are applicable at Hastings, Paraparaumu, Taupo, Timaru, Woodbourne, and Te Anau Manapouri.

AIP Amendment

There's a risk that pilots unaware of the reduced circling areas may fly outside the protected area.

GroupEAD's (Airways) Principal Designer, Mayank Bamola, has worked on the latest AIP Amendment.

"For years now, we've used speed reduction to avoid

obstacles in the circling area, but there's a feeling in industry that the circling radius is fixed, for example, a Cat-C circling radius is 4.2 NM.

"This isn't the case. When a speed restriction is in place, it reduces the arc radius."

Currently, reduced radius dimensions are not listed on the approach charts in the AIP. A proposed amendment in February 2016 will address this.

Where a circling procedure has indicated airspeed limitations lower than the standard circling speeds, the AIP approach charts will include a note specifying the maximum speed and the reduced radius, for example, Cat-C circling max IAS 160 kt. Circling area radius 3.5 NM.

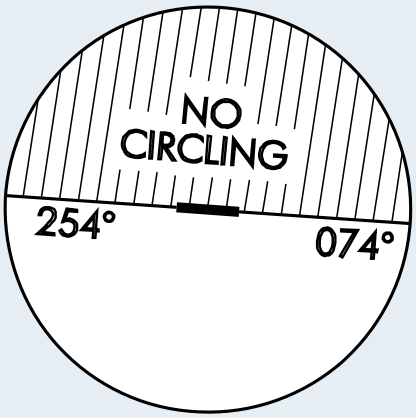
"No Circling"

In addition to speed restrictions, sections may be eliminated from a visual manoeuvring (circling) area – usually due to prominent terrain or obstacles in close proximity to an aerodrome. These sectors are annotated "No Circling" (see Figure 1).

Also remember that descent below the circling MDA can only occur when the pilot fulfills the conditions listed in rule 91.413 (c) *Operation below DA, DH, or MDA*.

Once a pilot begins descent below the circling MDA listed in the AIP, the obstacle protection offered by the circling procedure no longer exists, and the onus is on the pilot to maintain obstacle clearance visually.

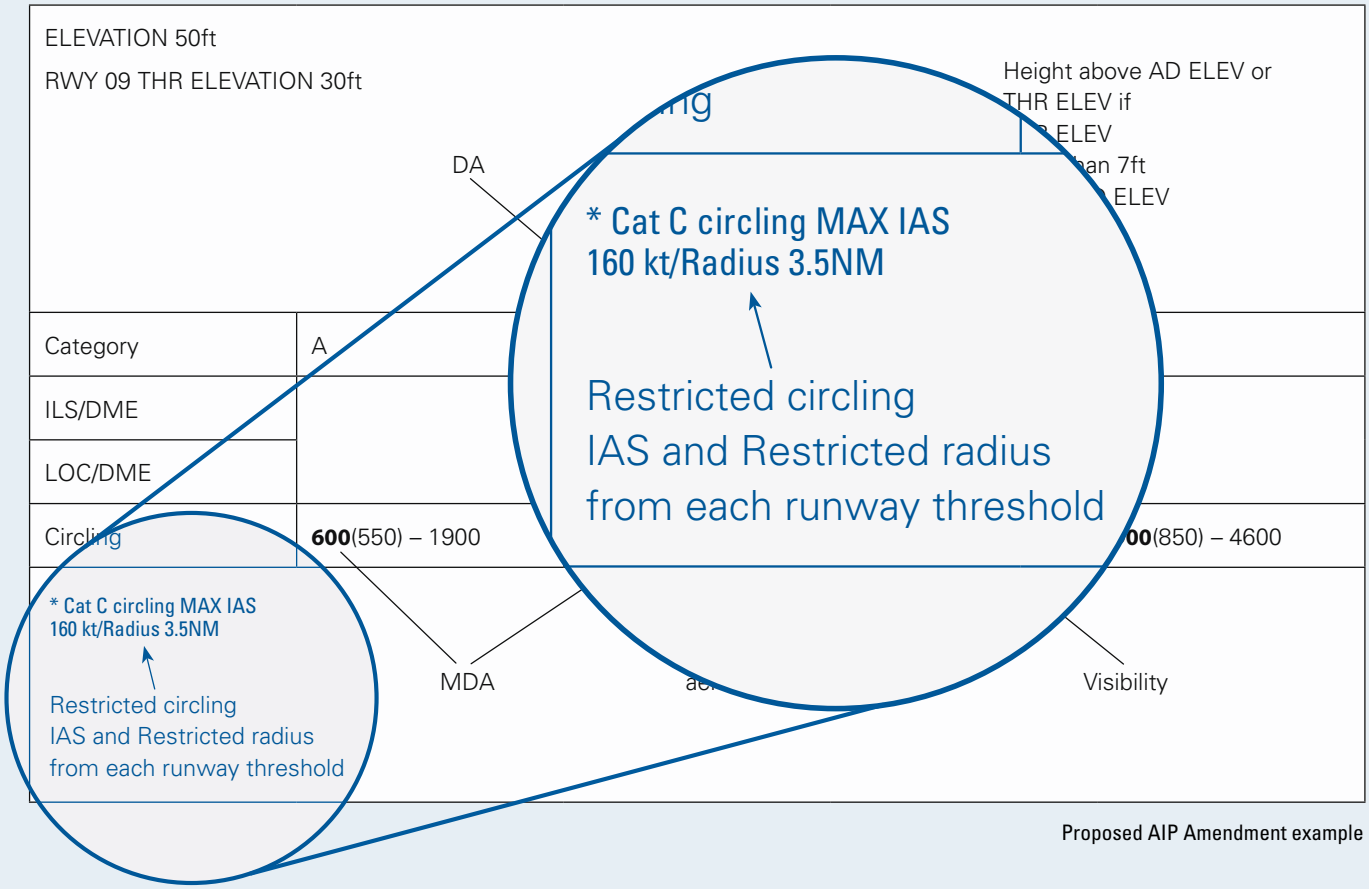
Figure 1
Circling is prohibited in "No Circling" sectors.



Missed Approach

If a pilot loses sight of the runway while circling to land, the missed approach procedure associated with the previously flown instrument approach must be started. The transition to the missed approach will depend on the circling direction being flown, and the point at which visual reference to the runway was lost.

The missed approach should be initiated by a climbing turn within the circling area, towards the landing runway, to return to the circling altitude or higher. This should be immediately followed by interception and execution of the missed approach procedure. ■



Proposed AIP Amendment example

Ballooning Legend Leaves Legacy

New Zealand ballooning lost one of its pioneers when Wing Commander Roland (Roly) Parsons died in mid-September. Roly set ballooning records that still stand.

Roly (Roland) Parsons

English-born Roly's love of aviation started at a young age, with his first flight in a Tiger Moth off the English coast when he was 15. He moved to New Zealand in the 1960s and served in the Royal New Zealand Air Force.

In 1972 he climbed Mount Cook, and realised he wanted to conquer it by balloon.

"I'd heard about people conquering the Swiss Alps and thought 'I want to do that here!'"

By the mid-1970s, he had become a New Zealand ballooning legend after setting three major ballooning firsts: crossing Cook Strait, Mt Cook, and the Southern Alps. He's still the only person to have successfully piloted a balloon over the Strait.

He achieved these goals when he was one of only six balloon pilots flying in New Zealand. His balloon, West Wind, was only the fourth registered in New Zealand.

In 2013, while archiving ballooning records, CAA Aeronautical Services Officer, and fellow balloonist, Michael Shouse, realised how important it was to record Roly's knowledge. He organised for Radio New Zealand's Lynda Chanwai-Earle to interview Roly. His quotes here are taken from those interviews.

Weather

Weather is a major influence on ballooning. When Roly set these records, weather forecasting was much poorer.

"Back then, we had information available, but the time lag and the communications were poor.

"Everything was slow and we had to rely on our own knowledge of Met.

"That's the difference between then and now. A lot of pilots that have excelled have a particular skill. It's more than just flying – they have knowledge beyond just their aircraft."

Roly spent a lot of time in the Marlborough Sounds researching, and waiting for the right winds before his Cook Strait journey.

Michael says we have better information today, "I can use a $5 app that tracks altitude, direction, and speed of winds. This micrometeorology [meteorology in a small area] is so critical to safe ballooning now. It's incredible what Roly achieved without it."

Dangerous Crossings

As with all pioneering flights, there was an element of risk. The Cook Strait crossing took several attempts before actually launching.

"Constantly changing winds and 'low-tech' access to timely weather reporting in the 70s made safe ballooning much harder," says Michael. "However Roly's intensive planning ensured he was as safe as possible given the information he had.

"It's the same principle today. Planning and using all resources available, leads to safer ballooning."

In the end, Roly flew much further than anticipated, landing in farmland around Whitby, Porirua.

Roly said, "But crossing Mt Cook was the most dangerous. We were in the zone between 12 and 14,000 feet with enormous wind turbulence – an error could have been lethal."

First Balloon Radio

Another of Roly's pioneering safety initiatives was an on-board radio. While they're standard equipment in balloons now, Roly's balloon was the first in New Zealand to be equipped with one.

Later life

In 1979, Roly left New Zealand to work for the Sultan of Oman Airforce in the Middle East, and took his balloon, West Wind, with him. In 1982, he stopped flying, and while continuing to take a passionate interest in other people's balloons, he never piloted one again.

His records still stand in New Zealand, and his legacy lives on. ■

Main picture: West Wind flying over Cook Strait, archive image courtesy Roly Parsons, 2013. Inset picture: Roly Parsons, 2013, courtesy Linda Chanwai-Earle, Radio New Zealand.

Wires – Working to Get Them Down

Since 1979, New Zealand helicopter pilots have had 116 wire strikes, with 28 deaths. Many of them were with power or phone cables, but 62 of them were from other wires, including fences and elevated gully wiring. To help reduce this, the CAA is getting behind campaigns to combat wire strike accidents.

Any helicopter flying at low level is at risk of a wire strike. They happen in New Zealand with unacceptable frequency – a serious concern.

Jim Burtenshaw, CAA's Manager Safety Investigation, says the CAA wants to raise awareness of the risks associated with helicopter agricultural operations. The CAA is also seeking support from Federated Farmers.

"If pilots, Federated Farmers, and the CAA work together we can create a strong campaign to prevent more wire strike accidents," says Jim.

Helicopter pilots Alan Beck and Dean Lithgow have been spearheading their own independent wire strike awareness campaigns.

The CAA is supporting both Alan's "Down to the Wire', and Dean's "Let's Get 'Em Down" campaigns.

Both campaigns are already receiving a good reception, with posters going up in rural supply stores across New Zealand, such as Farmlands, and advertisements in farming magazines.

Under the Health and Safety in Employment Act 1992, farmers must ensure regulations are complied with on their land. That means they must take all reasonable steps to eliminate hazards to ensure the farm is safe for aerial operations. That includes removing wires. Often farmers don't think of electric feeder wires as hazards because they, themselves, don't fly.

Stringing a wire over a gully or road to save money is not a good idea when you consider the consequences of an accident.

While the aim of both private campaigns is to get wires taken down, they also aim to educate pilots about the risks of wires, and to be aware of where the wires may be.

"We encourage all pilots to have all wires within the area of operation identified to them by the contracting party before they commence operations.

"Simply talking about it, or having it written into a contract, isn't enough. Pilots should sight all wires on the property so they know where they are, and constantly be aware of them," says Jim.

Even then, the risk remains and accidents still occur. The only solution to eliminate the risk altogether is to remove the wires.

The CAA web site has a new section with information on wire strike avoidance, www.caa.govt.nz/wires.

Jim says, "We're looking forward to the campaigns gaining momentum, and are confident they will help reduce wire strikes over time." ■

A flyer from the campaign spearheaded by Dean Lithgow.

A Day in the Life **of a PLA**

Parachute landing areas (PLAs) indicate the main – but not the only – landing areas for major parachute operations. The nature of operations and procedures can differ between aerodromes, so make sure you do your homework before departing.

For every aerodrome you fly to, check the *AIP New Zealand* aerodrome charts and the Visual Navigation Charts for parachute landing areas along your intended track. Actively look for the parachute symbol and read the notes below the AIP graphic, as busy PLA sites will often be accompanied by special procedures.

Simon Spencer-Bower, owner of Wanaka Helicopters, has significant experience operating in and out of Wanaka's busy PLA.

"The procedures work well for local operators because we are all aware of the airfield procedures and the aircraft and pilots involved. But problems sometimes occur when itinerant pilots who are not familiar with local procedures, or with the airfield landing plate, join the circuit."

Avoid carrying out a standard overhead join at aerodromes where intensive skydiving activity takes place daily. The AIP instructions may specifically state to either join straight-in or downwind.

If you are NORDO, never join overhead at an aerodrome where parachuting may be taking place.

"At Wanaka, we discourage people from doing a standard overhead join. That puts you straight onto the non-traffic side where the skydiving operations take place," says Simon.

If you need to carry out an overhead join to determine wind characteristics, then hold away from the aerodrome until all canopies are on the ground and you've confirmed there's no skydiving activity.

Third-party Risk

Mark Funnell, Operations Manager and Chief Pilot for Skydive Auckland (Parakai Airfield), Skydive Taupo, and Taupo Tandem Skydiving, rates over-flying traffic as one of their greatest risks.

"When it comes to what we call 'third-party risks', we have the same problems as anywhere else: the risk of another aircraft conflicting with our operations.

"Taupo is susceptible to over-flying traffic due to its central location. But we are quite fortunate that the drop zone is reasonably busy (operational seven days a week) and therefore, reasonably well known.

"Our guys are trained to listen out on the radio for traffic likely to conflict, so they can break the chain of events that could lead to a potential accident.

"However, there are limitations.

"I have one pilot per plane, and three or four radio frequencies for them to monitor. It can get very busy.

"The big thing is, if you're unsure, make a call asking, 'is there any parachuting happening at the moment?' It goes without saying that we'd rather talk to you early, than risk an avoidable conflict."

Steve Holder, Senior Pilot and Quality Assurance Manager for SkyDive Wellington, based at Masterton, urges pilots to treat PLAs in the same manner as danger areas.

"Always listen out on the local aerodrome frequency and make your intentions known well in advance, even if you intend to transit overhead well above the aerodrome circuit height.

"Radio clutter can sometimes be a very big problem for the jump pilot, especially on 119.1 MHz. So please do not assume that simply because you have transmitted your intentions, the jump plane or ground radio has actually heard you.

"And always proceed with caution until you can ascertain what's going on. We have had aircraft passing directly through the centre of the PLA. They've incorrectly assumed that because they spotted a parachutist below them, there were none above them." says Steve.

Photo courtesy of Skydive Wanaka

Mark Funnell explains how being predictable helps everyone at the field.

"Pilots who are predictable make it easier for everyone. Carefully consider your runway selection, because using grass cross vectors can put aircraft in conflict with circuit traffic and our skydivers.

"On that note, skydivers don't like helicopters because they can stop and move quickly in any direction, making them less predictable," says Mark.

Simon Spencer-Bower adds, "because of the versatility of helicopters, an operator or itinerant may tend to think if they can just sneak in low on the non-traffic side, then they'll be out of everyone's way. Whereas they could be right in the middle of a shower of sky divers!"

Skydiving Play-by-Play

It can take a jump aircraft anywhere between 15 and 45 minutes to complete a run from takeoff to touchdown. Parachutists can be dropped from as high as 20,000 feet agl (for tandem jumps), or as low as 2000 feet agl (for sport jumpers), and their chutes usually open anywhere between 5000 and 2000 feet agl.

Jump aircraft will always make a "two minutes to drop" radio call that states the number of canopies it is about to launch, and where they will be dropped.

Skydive Wanaka CEO, Evan Pearce, says the position for the drop is dependent on wind strength and direction.

"The pilot generally positions the aircraft within 3 NM from the PLA in an upwind direction. If winds aloft are light, then the aerial drop point will be closer to the PLA, and further away if winds are strong. After the pilot positions into wind and releases the first tandem parachute, the standard phraseology, 'jumpers away', will be broadcast on the local aerodrome frequency. If there are clients remaining on board who have paid for a higher altitude, the aircraft will resume its climb.

"Other pilots need to understand that manoeuvring whilst in free fall is difficult, and free-falling parachutists can also be extremely hard to see."

Diligent monitoring of the MBZ frequency is essential. Transiting aircraft should remain well clear of the aerodrome area – at least 3 NM away.

Evan Pearce continues, "Although rare, problems can occur during parachute opening. A main chute cutaway will occur if a canopy tangles or does not deploy correctly. After it's jettisoned, it will free float in the direction of the prevailing wind.

"If a bag lock occurs, the entire parachute – including storage bag – will eject as a solid object and fall to the ground much faster than just a main chute cutaway.

"Both situations are managed by the flight-following person on the ground. The radio call we'd make is, 'Wanaka traffic, Skydive Wanaka has malfunctioned canopy descending to the (location) on the airfield.' When it's landed, the other call on the unattended frequency will be, 'Wanaka Traffic, malfunctioned canopy has landed.'"

When Departing

When departing an airfield with a PLA, make sure there aren't any canopies in the air before starting your engine. If you have your prop turning on the ground, operate with extreme caution within 100 metres of an active PLA. If there are any canopies in the air, it's safest to delay your start.

If you're committed to departing before a drop begins, then it's safest to climb straight ahead for at least 3 NM before turning 90 degrees, flying parallel to the active parachuting area.

It's Called the Drop Plane for a Reason

Once the parachutists are clear, the drop aircraft will descend rapidly (up to 4500 ft/min). In many cases, the drop aircraft may actually land before the parachutists.

Skydive Taupo's Mark Funnell says circuit integration is an area of high risk.

"As drop pilots spend most of their time above the circuit traffic, one of the big risks the drop pilot faces is circuit reintegration.

"Due to our high descent rates and the associated risk, we join on the non-traffic side then join in with the other circuit traffic on final approach."

But be aware that not all jump aircraft join on the non-traffic side of an aerodrome, as the nature of operation differs with location. ■

Profiling Risk in Part

The CAA has developed a second sector risk profile (SRP) to look at how risks can be reduced. This time it covers Part 135 operators – helicopters and small aeroplanes.

The Part 135 sector is a small but increasingly important part of New Zealand's growth both domestically and internationally. It is vital that we understand the risks to operators and customers. From 2006 to 2014, there have been 45 accidents involving operations under Part 135 of the rule.

Risk-based Regulation

The CAA aims to reduce the economic and social costs of aviation accidents, and uses a risk-based approach in regulating the aviation industry.

Following a tender process, in early 2015, the CAA commissioned Navigatus Consulting to conduct the Part 135 Sector Risk Profile.

An SRP is an effective tool that examines various underlying influences on safety within a sector to assess the risks, so that targeted and appropriate intervention can be applied.

Navigatus conducted research, surveying Part 135 participants (pilots and operators) and collating their feedback, interviewed CAA staff, and worked with the CAA to analyse operator and accident date.

From the collected information, Navigatus produced a report identifying and ranking the risks. This report is now available on the CAA web site, www.caa.govt.nz, "Safety Info – Safety Reports – Sector Risk Profiles".

The Part 135 Sector

Part 135 operators cover a vast range of activities including passenger transport, air ambulance, and search and rescue.

The sector is expected to expand, particularly helicopter operations, driven mainly by projected tourist numbers.

What Are The Risks?

The risks are grouped into five key themes:

» training and pilot experience

» organisational environment and culture

» sector safety culture and collaboration

» institutional clients and their role in safety leadership

» the regulator and its practice.

Within the five themes, 17 risk areas are identified and assessed based on the immediacy and distance or directness of influence on pilot decision-making.

For example, the risks most directly impacting pilot decision-making in a flight and operational sense include:

Fatigue

Some pilots tolerate a mild to medium level of fatigue during peak season due to a perceived obligation (that may be self imposed) to 'get the job done', or the belief they can handle it.

Pressure to Fly in Challenging Conditions or Circumstances

While most operators are aware of the support they need to provide to pilots – especially newer pilots – and ensure there's

t 135 Operations

no pressure to fly in challenging conditions, this isn't evident across all operators, especially during peak seasons.

Risks areas of direct impact but relevant more to the operator or organisation include:

'Just Culture'

We know that an honest, supportive culture is important for driving safety performance. This is where everyone can raise concerns and issues, and discuss and learn from operational experience and mistakes. However, developing and maintaining both a voicing and 'just culture' takes determination and leadership. These cultures aren't universal across the sector.

Other risk areas with a close impact on pilot decision-making but more relevant to operators and organisations include:

Pilot Experience Gap

There is a sector-wide experience gap between new and very experienced pilots. Some younger pilot in the fixed-wing sub-sector leave to pursue a career in larger aircraft operations, while some in helicopter sub-sector leave to gain further experience overseas.

Audit Consistency and Focus

Some operators are looking for mutual benefits from their audit involvement with the CAA. Further work is planned to increase CAA auditor skills aimed at improving consistency and adding value.

How Will Risk be Reduced?

"Responsible operators will identify and manage their own risk," says Dominik Gibbs, CAA Regulatory Intelligence Analyst.

"The SRP enables them, and the CAA, to have a better understanding of the risks associated with their operations, meaning we can work together to set safety performance goals and reduce risk."

Now that the report has highlighted the risks faced by this sector, it is the responsibility of the participants and the CAA to work together on mitigating those risks.

"We want operators to use the report to develop actual tasks to address the risk areas. Systems will then need to be developed to track the work results, provide resources as required, and establish timeframes for completion of tasks. This is consistent with the implementation of Safety Management Systems," says Dominik.

"Obviously, all the risks can't be mitigated at once. Some areas will be more challenging than others.

"But even starting on the smaller 'quick wins', will start to reduce the risks."

SRP and Other Aviation Sectors

The previous SRP on the agricultural sector was well received and progress has been made, but work is continuing.

"This is about changing culture within the industry, so it's a long and ongoing process," says Dominik.

"However, we're now working more closely with the New Zealand Helicopter Association and the Agricultural Aviation Association. They're using our data in their regular safety bulletins which were started after the last profile was released."

The CAA is now looking at other sectors that will benefit from an SRP.

"We want to encourage a strong safety culture," says Dominik. "This SRP allows the industry and the CAA to understand the risks, and how they impact pilots, operators, and the sector.

"We look forward to working closely with Part 135 operators to reduce risk and make aviation even safer." ■

An Excess of Skill?

How does a GA aircraft crash with two experienced pilots on board? Does the plethora of expertise in the cockpit actually increase the risk? If so, what can be done to reduce the uncertainty over who is in charge?

Many pilots regard flying with an aviating mate one of the most pleasurable journeys they can make.

For CAA Flight Operations Inspector, Terry Curtis, a day out with a fellow enthusiast is "really good fun".

"A most enjoyable experience," he says.

While two-pilot data is not collected by the CAA, American research indicates that about 12 per cent of GA (General Aviation) accidents happen to aircraft with at least two experienced pilots on board.

Without data or voice recorders, it's impossible to know exactly how that can happen. But it does.

There are plenty in GA who say it is precisely having two pilots in a GA cockpit that heightens the risk of an occurrence.

Terry Curtis, who's been a training captain for many years, and used to supervising others of equal rank, says often those dynamics are a function of the pilots' personalities.

"If I'm not the pilot-in-command (PIC), I don't touch any controls, unless I'm asked to. I might make suggestions, if something concerns me, but I don't touch anything.

"But there are pilots who, having been in charge of a cockpit for many years, find it almost impossible to cede complete control to someone else – even a mate of equal ability."

American pilot Mike Twombly, writing for the International Council of Aircraft Owner and Pilot Associations, describes a tense trip with a flying mate.

"During my stint in the left seat, he made a small adjustment to one of the power levers. I found his presumption odd and more than a little annoying, but in the interest of harmony I said nothing.

Then, on the landing rollout, he reached over and flipped the flap lever up to the Retract position. "Don't do that!" I snapped.

*Immediately, a tense silence pressurized the small cockpit. After exiting the runway and completing the after-landing checklist, I spoke through semi-clenched teeth: "Don't ever touch anything unless you first tell me what you are going to do, and I acknowledge." He nodded, looking embarrassed by his action and a little embittered by my reaction."**

The opposite can also cause problems, says CAA Aviation Safety Adviser, Carlton Campbell.

"You can have a PIC who's intimidated by the person sitting in the right hand seat. And the person sitting in the right hand seat knows it.

*Don't Touch That Dial – *Flight Training*, 2002

"That can lead to difficulties if there's a flying incident brewing. The PIC defers too quickly to the other pilot, or the other pilot is too quick to question and overrule what the PIC has chosen to do."

"I recall a Tiger Moth accident in Central Otago – the PIC had more than 400 hours. On the day he crashed, he had a commercial pilot in the front seat.

"It was likely that the PIC would have deferred to that commercial pilot as being more qualified and more experienced, and a better pilot than him. But the commercial pilot had no type experience on that aircraft.

"They followed the Otago rail line, low-level circuiting around and looking at the train. They took the plane low down in a valley, and ended up crashing. Both were killed."

Peter Hendriks, chief pilot and owner of Wanaka's Classic Flights, says a planeload of experienced pilots can be the worst case scenario.

"No-one wants to say anything, even if they're worried, for fear of losing face, or causing offence."

At the root of the problem is the lack of standard operating procedures, such as those used by airlines, to remove the ambiguity about who does what, should the plane fly into trouble. Or who does what, full stop.

Often, the biggest nod GA pilots will give to that, is 'you be PIC today'.

"That's not really enough," says Peter Hendriks. "The pilots need to agree on what that actually means, how the two of them are going to manage the flight."

Formation flying offers a good illustration of how that could go.

Dave Brown is a member of the Roaring Forties Harvard display team, and overseer of NZ Warbirds Association aerobatic and display training. He says while good formation flying is all about discipline, there are three things that help prevent a pilot following the leader into the ground.

"The leader does everything during the flight – radios, lookout, navigation, decisions on the right positioning and energy for each manoeuvre.

"But prior to any formation flight, all the pilots are thoroughly briefed and have the opportunity to ask questions, seek clarification, and make comments.

"Secondly, at any time during a formation flight, any one of the pilots who sees a threat to safety – a mechanical mishap with

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their own aircraft, or an 'intruder' aircraft, for instance – can call a 'knock-it-off', and without questioning, the whole formation, including the leader, will abandon the exercise and deal with the abnormal situation. Everyone understands the importance, and urgency, of the knock-it-off call.

"Lastly, after every display we have a debrief. Frank Parker – president of the Warbirds Association – often gets a box at the beginning of a debrief and says 'that's for your egos', meaning the session has to be where home truths can be aired, and are to be regarded as a very important part of learning.

"The first question of any debrief is, 'any safeties?' and someone might say 'I think we were too close to the hill and I had trouble holding on in the turn' and there is no deriding of that, even if it comes from someone new to formation flying.

"There's always room for improvement, and that includes of the formation leader."

Dave says display sequences are also planned, "by committee".

"Anyone has the right to veto a new manoeuvre. Someone might say 'we've tried this three times and I'm still not comfortable with it, I'd rather we gave it away'. And we will."

The airline sector has agreed phraseology – part of its Crew Resource Management – for the first officer to use to persuade the captain to desist from their course of action.

Terry Curtis, who flew in the left hand seat for Mount Cook Airlines for 20 years, says first officers, who become uncomfortable with the decisions the captain is making, would start by saying something like, 'I'm not entirely happy with this' and progress through to 'Captain, you must listen to me!' which is the agreed-upon phrase for the captain to desist immediately from his or her course of action.

He agrees that in GA, two flying mates need to come up with a similar statement.

"'I have control' is pretty effective," Terry says, laconically.

Terry has had to use it a couple of times, once when the PIC was so involved with other things, he forgot to 'fly' the plane.

"We had an approaching aircraft, which I mentioned to this chap a couple of times. When it was obvious I did not have his attention, I finally said 'I have control!' and moved away from the other aircraft's flight path.

"He took control back pretty quickly and moved us further away from the second aircraft, but by then the panic was over.

"We survived and the plane was unscathed but it wasn't the nicest of things to be dealing with."

Terry says the two pilots should be talking all the time.

Advice from Dave Brown, Cathay Pacific captain, Warbirds display pilot, and flight examiner:

All pilots should review the weather and NOTAMs, ideally together, because that will provide opportunities to discuss possible options for the route, weather and so forth. Other pilots can also ask questions or raise any concerns about the PIC's plan. If the other pilots don't like the plan or have concerns about the safety of the flight, that's the time to say so, and if necessary opt to stay behind. Often, if the weather is marginal and someone stands up and says they're not going, it inspires others to review their plan and delay the flight for an improvement.

When flying with other pilots, allocate them tasks when workload is high. For example, in your takeoff brief you could ask them to make the MAYDAY call if the engine fails. On a cross country you could get them to call the FIS and get updated weather for you.

If you do encounter weather along your route, talk about what you are seeing, what you think you will encounter further along track, and what you are thinking of doing. That will save them wondering what you are going to do next, and will give them an opportunity to offer their thoughts, provide some local knowledge or recent experience, and in the worst case, state their concerns for the safety of the flight.

If that communication is done in a timely and efficient manner, then the PIC should have time to evaluate all the inputs and possibly revise the plan.

At the end of the flight, a discussion or debrief can be useful in reinforcing any learning points from the flight for all concerned, particularly if the flight hasn't gone as planned!

Photo: istockphoto.com/bestaviation

"Discussing how the trip is going, and listening to one another. The PIC needs to realise that while the final decision about what to do rests with him or her, the 'passenger pilot' might have flown that route before, or seen similar weather."

Dave Brown is a Cathay Pacific captain, and tries to set the tone of a flight right from dispatch.

"I try to get the opinions of the crew members as to what we should do. I don't say 'I think we'll take 90 tonnes of fuel, what do you think?' I'll say 'you've seen the weather, and given our load, how much fuel do you think we should take?' That encourages them to feel confident in expressing their opinions.

"You can generally rely on an Aussie first officer to tell you what they think! But the brand new second officer, especially from a culture that is quite hierarchical, may hold back.

"I like to discuss the flight as I go. Say something like, 'I'm thinking of doing such-and-such, are you all happy with that?' If I've set the right tone from the start, they will feel comfortable pointing out any issues they see in what I want to do.

That also provides good opportunities for an experienced pilot to pass on some of his or her experience to a less experienced pilot."

Peter Hendriks says there should be a clearer indication of who will do what before the GA flight begins.

Do you have a story to tell about the dynamics of a cockpit with more than one experienced pilot on board?

CAA Intelligence Analyst Dominik Gibbs is keen to hear such stories, to examine the nature of that risk.

dominik.gibbs@caa.govt.nz

"Radio for instance, and in what circumstances the non-flying pilot's opinion will absolutely have to be taken notice of."

Carlton Campbell says he's conscious of making the roles explicit because he often flies with pilots with as many flying hours as him.

"So while there may be two people who can rightfully have control, generally one will be more qualified to be PIC – perhaps more experienced on type, for instance.

"If I'm getting into a cockpit with someone equally qualified, I'll say 'you're more current and more experienced in this aircraft. If there's an emergency, I'm not going to do any taking over. I'll sit back, and offer suggestions, but that's all'."

To read about how two pilots can work well together in the same cockpit, go straight to our next article *Flying on a Dying Engine*. ■

Flying on a **Dying Engine**

Sunday, 30 August 2015, early afternoon. Christchurch air traffic control logs a MAYDAY from a Piper Arrow PA-28R-200, after some sort of explosion, and partial engine failure.

About five nautical miles out to sea, the three occupants of Romeo Tango Echo refuse to give in to their rocketing blood pressure, and with deliberate calm, begin trouble checks…

If student pilot Marcus Bekker (20 hours) had wanted a masterclass in what to do after partial power loss, he could not have had better tutors than his two North Shore Aero Club mates.

On the last Sunday in August, about 2 pm, Marcus was sitting in Piper Arrow RTE behind PPLs Craig Vause (640 hours and PIC) and Steven Perreau (approaching 1000 hours, right hand seat).

The single-engine retractable aircraft had just taken off from Christchurch International Airport, heading to Omarama in the MacKenzie Basin, where the three men were meeting up with other North Shore fliers.

Then disaster struck…

"We'd spent all morning monitoring the not-great weather," says Steven. "We'd looked at the charts, repeatedly consulted MetFlight, and rung experts around the region."

The pilots identified a very large 'hole' to the north of Banks Peninsula off the coast that they thought looked promising.

"But I've had enough scares in weather," says Steven, "enough experience not to try anything dumb, so we waited."

Finally, visibility improved to five kilometres, and about 1100 ft around the circuit, so the North Shore fliers decided to have a go, given that the web cams were showing it was fine at their destination.

As they flew towards that precious hole of clear sky, the pilots found it was a bit further offshore than they had first thought.

"But Craig and I felt very comfortable that we were going to have no problem doing a lazy climb, and be well clear of cloud. It was working out perfectly.

"We were maybe five nautical miles out, 900 ft and 15 minutes into the flight, when Craig advanced the throttle to begin that climb.

"And then suddenly, there was a huge bang."

"After the explosion," says Marcus, "the aircraft began to shudder violently.

There were a few seconds of stunned silence, as we tried to get our heads around what the heck had just happened!"

Steven says, however, his and Craig's training almost immediately kicked in.

"We both smartly went for the propeller control as our first check because it felt like the prop had driven to full course. Then we both went for the mixture control.

"Then realising it was *Craig* that was PIC, I took my hand away from the controls, and concentrated on the radio.

"While Craig continued the trouble checks, I declared MAYDAY to Christchurch Control, and immediately after, Christchurch Tower."

Craig lowered the nose, and, with the engine coughing and vibrating, he began the slow turn for the coast.

"I was thinking we would probably end up in the water that day," says Craig. "The heart was definitely pumping. I'm a very relaxed person normally, but oh boy, that coast seemed a long, long way away."

In the back, Marcus, too, was mentally preparing to "go for a swim".

"I tried to remember if I'd done a recent backup on my laptop, because that was probably going to go for a swim as well!" he now laughs.

On Steven's instructions, Marcus stowed anything loose away in the back, preparatory for landing – wherever that was going to be.

"Then I just started grabbing fistfuls of lifejackets," Marcus says.

> *"Their training just came flooding back. It was great to see how that works in reality."*

"Not having lifejackets on before we took off from Christchurch was a real mistake," observes Steven. "It was a curious decision, given my practice of always doing so if I'm flying over water. I can't really account for it, except to say it was definitely *not* the right decision to make!"

Disturbing the studied calm of the cockpit, having to put on those lifejackets in the middle of an emergency, was the only time the stress level obviously rose.

Steven and Marcus put theirs on and then, while Steven flew, Craig attempted to don his.

As sometimes happens, even on the ground, Craig's lifejacket twisted horribly, preventing him getting it on properly.

"He's wrestling with this thing," says Steven, "so with cool I definitely did not feel, I said to him 'no hurry, take your time'."

With a second go, Craig's lifejacket was on successfully, and he took back control.

"Craig had trimmed the aircraft beautifully," says Steven. "We were doing about 110 miles an hour – just above best glide speed, there was no control load, the nose was much higher than normal level flight and it felt like it was maintaining that."

Coming out of the turn, all three pilots were dismayed to see how far away land appeared to be.

"We'd lost about 200 feet in the turn," says Craig. "And I really wasn't sure we could maintain height long enough to reach the coast.

"But then I scanned the instruments and thought 'well, hang on a minute, we do have some power, we're maintaining height, we just might make the coast, and if we do, and the engine gives out completely, I'll try to land on the beach.

"Christchurch Tower were fantastic. They were encouraging us, telling us we were doing a great job, giving us slight changes in bearing to make the journey to the coast quicker.

"So we reached the coast, and we still had 500 to 600 feet. At that point, Christchurch Tower said 'there's some obstructions you need to avoid, so we're going to track you up the Waimakariri River and bring you in that way.'

"We get to the river and we still have 400-odd feet and I'm beginning to think, 'we might be okay here'."

Steven did most of the radio. "My acknowledgements of ATC transmissions were pretty terse I think! I was concentrating so much. I think I was just replying with 'understood'."

"Communication between Craig and Steven was pretty terse too," says

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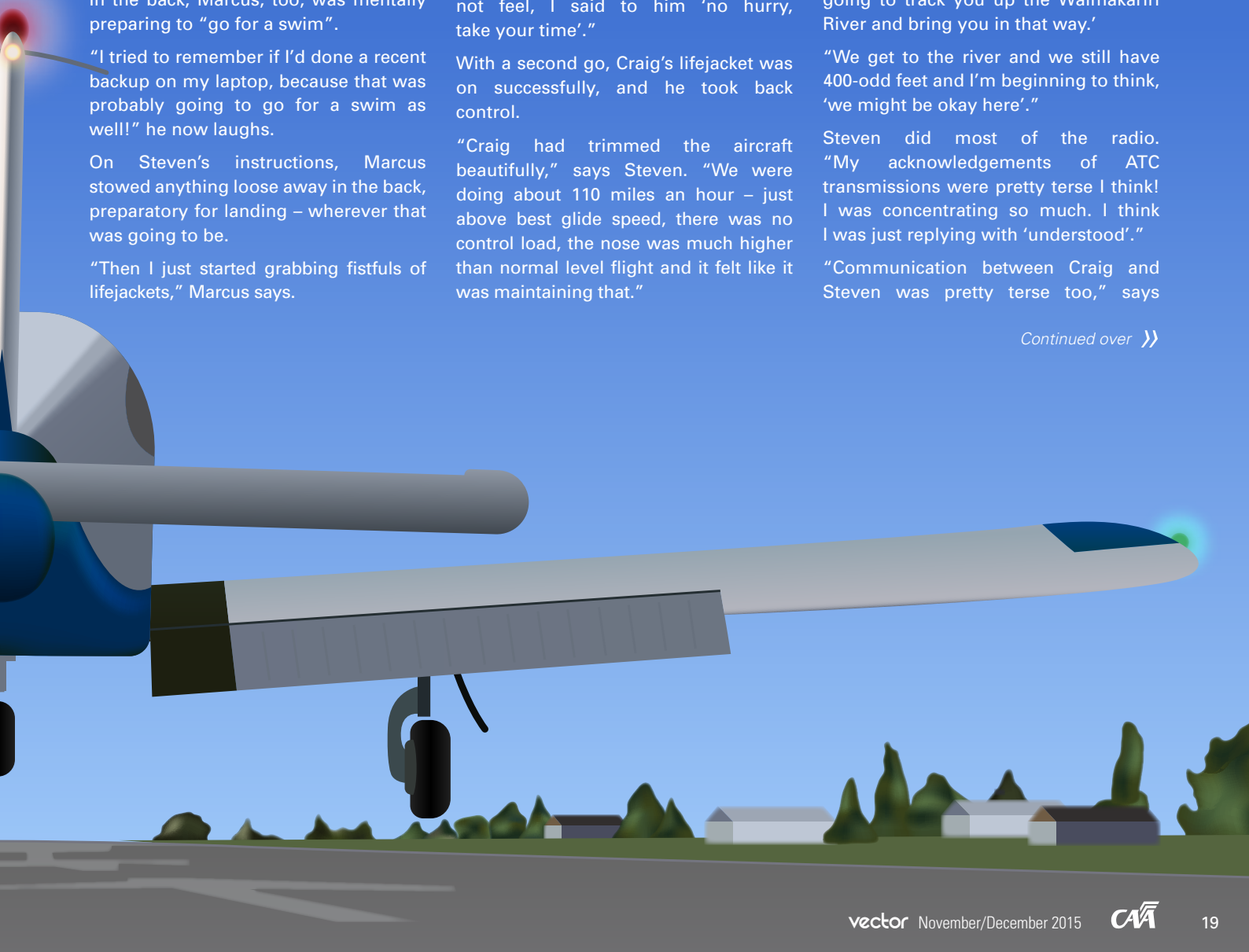

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> *"...with not a great deal of communication, they carved up the workload. Craig's flying the plane, Steven's doing the radio."*

Marcus, "but it was remarkable to see how well they worked together to deal with the emergency.

"The two of them, their training just came flooding back. It was great to see how that works in reality.

"Every student pilot would benefit from being part of something like this. Although, let's face it, you wouldn't buy a ticket to do it!

"But seeing how, with not a great deal of communication, they carved up the workload. Craig's flying the plane. Steven's doing the radio.

"And the most amazing thing of all, is this total calm in the cockpit."

"Yeah, how we worked together was almost co-ordinated," says Craig. "It was really just second nature through training.

"We had a job to do and we did it. But it was great to know the person next to me was a high-hours pilot. We've flown together a lot over the years and that helped the situation."

As the crippled aircraft began flying up the Waimakariri, Christchurch Tower asked the pilots to switch on their ELT (beacon).

Steven says, "Every time there was a radio transmission, the ELT went 'whoop, whoop, whoop' and completely drowned out any radio call. It just destroyed the messages.

"Despite using a noise-cancelling headset for a few seconds, I could hear nothing ATC said, so switched off the ELT. We would have to do without it."

At 400 ft, Craig and Steven started playing "look at the paddocks".

"I would point to one," says Steven, "and say "we could go there" and he would say "...and then we could go there" and I'd say "yep". This is what we were doing, identifying where we could land should the engine suddenly quit. We really expected it would, it was running that badly.

"We agreed that if the engine did pack it in, we were closing the throttle and flying to the ground," says Steven.

But the engine, despite its terrifyingly rough running, somehow, managed to keep going.

Air Traffic Controller on duty in Christchurch Tower, Louise Tasker, says there were five controllers with binoculars on RTE during the final approach stage.

"We switched the runway and approach lights on maximum to help these non-locals get a better idea of how far they had to go," she says.

"We could suddenly see the bright lighting in the distance," says Steven. "That was great, because the weather had deteriorated, and it was quite dark.

"Around mid-final, and lining up with the runway, as we started over the ALS (runway approach) lights, the engine was really packing it in. It was going BANG, struggle, struggle, BANG, struggle, struggle," says Steven.

"By now it was impossible to maintain any real height and I said to Craig 'I don't think we can make it' and you could see him doing some working out in his head, and he said 'no, no, we can do it'.

"So I said 'right, I'll do the gear, I'll do the flaps, you just fly the plane."

"Steven made the decision," says Marcus admiringly, "not to unlatch the door – which is actually done in emergency procedures – unless we went down in the last 200 ft. Opening the door would have created drag and may have made the difference between getting back, or not.

"It was the same with the landing gear. He decided not to extend it until the last few seconds, again because of the drag it would have created.

"The tower called us, saying 'your landing gear is not extended' and Craig beat Steven to the radio, replying 'we know!'"

"We were now on short final," says Steven, "we were ridiculously low and I said to Craig as calmly as I could, 'um, do you think you could give us a little bit more power?'

"And he pushed the throttle all the way forward and said, in this really low-key way, 'nah, that's it'. Suddenly, we were crossing tarmac. I said 'gear down... gear coming... flap one... flap two'. For some reason Craig looked down briefly and the nose fell, and I said 'Flare!' and he looked up again, and caught the flare nicely, and I said 'flap three'.

"And the next thing we're touching down and going "oh my God,"... and he still laughs incredulously.

The three pilots were not the only ones celebrating.

"We were all very relieved to see them get the gear down, and execute a safe landing," says Airways' Louise Tasker.

The engine had finally packed it in, just on landing.

"Craig thought I'd cut the engine," says Steven. "I thought he had!

"Then the airport fire engines were screaming towards us. We were thankful for their quick response but very pleased we didn't need rescuing!

"I'm not sure how much chaos we caused, but I think we shut an international airport for a good 25 minutes. It could have been longer if not for the obliging chap who patrols the airport for bird hazards. He towed RTE off the runway for us and over to the Canterbury Aero Club apron."

Local club members also rushed to the aid of the shaken pilots, filling them up with coffee, congratulating them with back slaps and ferrying the now-stranded trio about.

The three admit to a few sleepless nights after the trip, replaying the adventure in their minds.

For Craig, the 'take-home' from the day was the confidence boost from surviving such a hellish experience.

"I know now that should I ever be in a similar situation, I can handle it without falling apart."

But the three pilots are also very aware of the help Airways staff gave them in guiding them home.

"They were professional, composed and efficient," says Steven. "It was great to know they were with us through all the excitement."

Marcus says the experience has refocused his mind on why so much training is on emergency flying.

"Having gone through it, you see the benefit of that training, stuff that you might otherwise not have bothered much with, thinking 'I'll never need this drill' but after something like this, you really do get it."

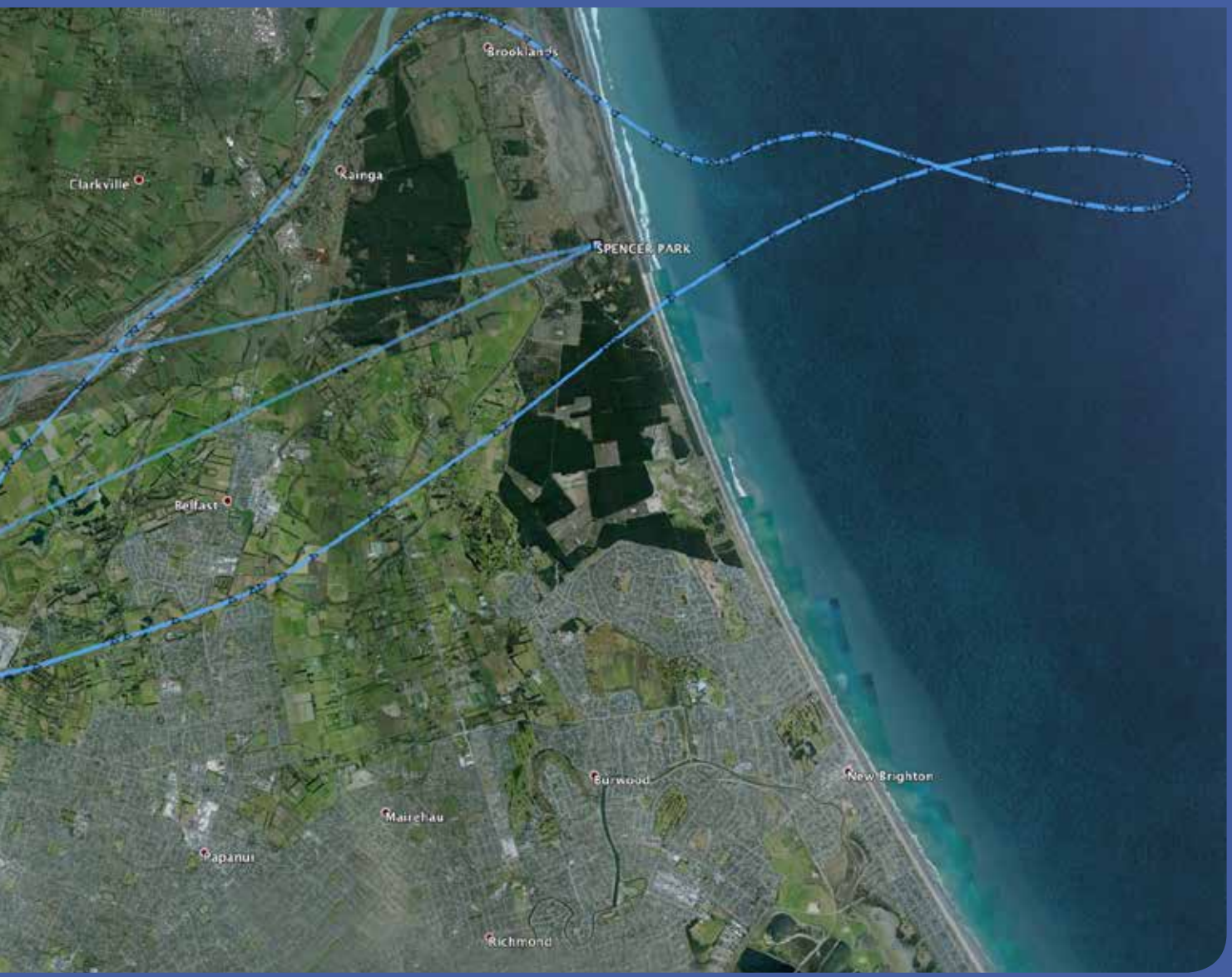
For more about how two pilots in the same cockpit can enhance, or diminish, their flying experience, read our previous article *An Excess of Skill?* ■

Investigation

The CAA safety investigation is continuing into the cause of the partial #3 cylinder separation and subsequent partial power loss on the Lycoming IO-360 engine fitted to ZK-RTE.

Over the years there have been a number of occurrences where the cylinder hold down through bolts and studs have failed, which can lead to a full cylinder separation from the crankcase, and subsequent engine failure.

Additional information regarding issues with weld-repaired crankcases can be found in the Australian Civil Aviation Safety Authority Airworthiness Bulletin 85-015 published 19 April 2013.



Map data: Google Earth, Spidertracks

New App to Report Accidents and Incidents

Reporting accidents and incidents is a legal requirement, but it also helps the CAA know where to focus our efforts. You can report accidents and incidents online, by email, over the phone, and now with a handy app, called *Here and Now*, available on iOS and Android.

The app uses your phone's GPS functions to pinpoint the exact location of the accident or incident. You can also attach photos to your report by using the '+' button under the location map.

"Using the *Here and Now* app to report an incident or accident fulfills your requirements under Part 12 for notification and reporting," says Michael Campbell, Team Leader Safety Data Management. "However, the CAA may contact you for further details if required."

While you won't have to fill in the CA005 form to report the accident or incident if you use the app, if someone has been seriously harmed then this will need to be reported separately to the CAA as soon as possible. Call 0508 ACCIDENT (0508 222 336) and then fill in the Accident/Serious Harm Notification Form available on the CAA web site, www.caa.govt.nz, "Health and Safety – Report an HSE Incident or Accident".

If you need any emergency services, you should always call 111. "The app includes an emergency feature to prompt you to call 111, just in case you haven't," adds Michael.

The app can be downloaded for free from the Apple Store, or the Play Store for Android. After you have downloaded the app, you need to register it, and you must have a valid email address to do this.

There are also five other CAA apps available. These were featured in the July/August 2015 issue of *Vector* in "Get Mobile with the CAA". ■

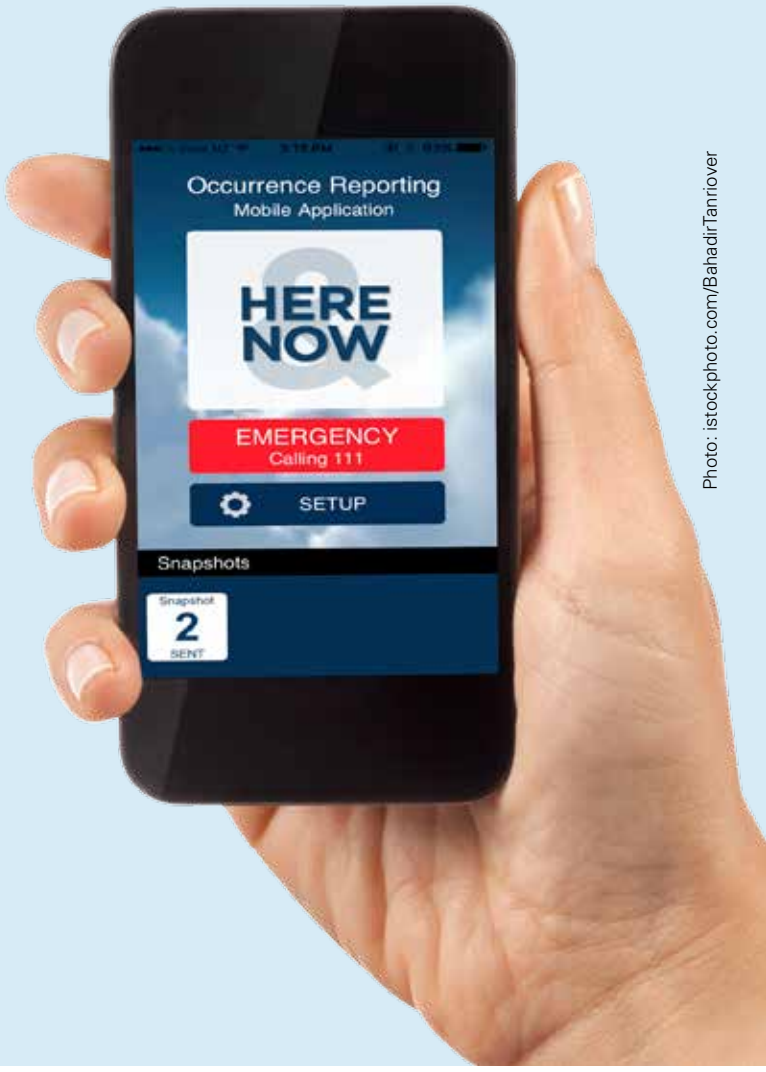


Photo: istockphoto.com/BahadirTanriover

2016 **Avgas Changes**

With the New Year comes a change to the dye used to colour avgas. From green to blue. But the change won't affect the performance of the fuel, and you will still be able to distinguish avgas from other fuels.

Avgas is sourced from South Korea and dyed on entry into New Zealand. In early 2015, New Zealand suppliers began importing Avgas 100LL, which has a lower lead content than the previously-supplied Avgas 100. ■

New **AIP Shop Online**

While the AIP shop has the same web address, there's been a change behind the scenes. The CAA now contracts GroupEAD (a joint venture between Airways and GroupEAD Europe) to provide aeronautical charting publications within New Zealand.

In October they launched the "Aeronautical Information Shop", where you can purchase all parts of the AIP, such as AIP Vols 1 to 4, aeronautical charts, and subscribe to the amendment service.

The online shop address is www.aipshop.co.nz, or phone GroupEAD on 0800 500 045. ■

Identifiable Paint Schemes and Callsigns

Do you want to brighten up your aircraft with a fancy new paint job, or use a callsign that reflects your aircraft's personality? It pays to check with the CAA that you can actually go ahead with these changes.

This Nanchang CJ-6, registered as ZK-STP, sports an approved identifiable paint scheme (IPS). This IPS is based on the original paint scheme of the Nanchangs, that were manufactured in China for use by the Chinese Air Force.

Photo courtesy of Gavin Conroy.

The Civil Aviation Rules require all New Zealand-registered aircraft to display a registration mark. Specific requirements on how these marks should be displayed are spelled out in Part 47 *Aircraft Registration and Marking* (available on the CAA web site www.caa.govt.nz, "Rules").

All aircraft are required to display the registration mark when flying domestically, and those above 5700 kg MCTOW must display both nationality (ZK) and registration mark, for both domestic and international flights.

The current rules are based around CAA's ICAO commitments. For more information, see the *Vector* article, "Marks for Originality", May/June 2010.

Identifiable Paint Scheme

Under Rule 47.104 *Approval of identifiable paint scheme and markings*, aircraft owners can apply to have an identifiable paint scheme (IPS) and markings, instead of displaying their registration mark.

David Gill, Team Leader Airworthiness, advises people to contact the CAA's Aircraft Certification Unit beforehand – email: info@caa.govt.nz.

"We can let people know what information is required and if the general design will be acceptable, before they start investing in any paint work."

Any Special Category aircraft can apply for an IPS, but aircraft operating with a Standard or Restricted category airworthiness certificate can only apply for an IPS for historical reasons. For example, to replicate a military colour scheme or an old civil scheme which used smaller size marks.

"The CAA will assess the IPS to ensure it is sufficiently unique so that it cannot be confused with other aircraft of the same type which might also have an IPS," says David.

"Another aspect that is now assessed is to ensure that the IPS contains a unique feature, such as a prominent letter or number, which could be used as the basis for a callsign."

Use form 27047/04 (all forms available on the CAA web site, under "Forms") and include the information required as specified in rule 47.104. For example, photographs or sketches clearly depicting the proposed IPS and markings of the aircraft. High resolution digital photos are preferred.

Callsigns

Rule 91.249 *Aircraft callsigns* requires the pilot-in-command of a New Zealand-registered aircraft to use the name of the aircraft manufacturer, or the aircraft model, and the last three letters of the aircraft registration marking, as their callsign.

Aircraft operators can apply for approval to use a non-standard callsign. Jeanette Lusty, Team Leader Special Flight Operations and Recreational Aviation, says, "An approved paint scheme allows them to ask for a non-standard callsign, using form 24091/05 to apply. Non-standard callsigns are for use within New Zealand only."

Jeanette notes, "It's very important that operators get their callsigns accepted before using them. We've noticed multiple aircraft using the same non-standard callsign, which obviously means the operators didn't get prior approval. This is dangerous, not to mention confusing, especially when they end up in the same airspace.

"Currently, applications for non-standard callsigns are on a temporary hold because of concerns about the number of unapproved callsigns being used." ■

Robinson Helicopter Safety Review

In the interest of safety, and after consultation with aviation participants, the Director of Civil Aviation has imposed conditions relating to the training of operators of Robinson R22 and R44 helicopters.

Risks to operators of these Robinson helicopters have been identified by the FAA, TAIC, and CAA's own review, held earlier this year.

The conditions align New Zealand with the FAA SFAR 73 *Robinson R-22/R-44 Special Training and Experience Requirements*.

Some key points are:

» A new syllabus of R22/R44 'ground' and 'in-flight training' is prescribed.

» The training will be completed by CAA certificated Part 119 and 141 organisations, or operators who have an approved Robinson safety course.

» It will be delivered by suitably approved and qualified A or B-cat instructors.

» Ongoing training will be required every 24 months.

» The pre-solo dual requirements on the R22 and R44 have been raised to 20 hours.

For more information, including all the conditions, see the CAA web site, www.caa.govt.nz, "Pilots – Robinson Helicopter Safety Review." ■

50th Walsh Memorial Scout Flying School

The 50th Walsh Memorial Scout Flying School will be held from 7 to 22 January 2016, at Matamata Aerodrome.

In 2016, the two-week flying school will also feature a day of reunion and celebration on Saturday 16 January. More information can be found at www.walsh50.co.nz.

Seventy-two students attended the 2015 school, and the 2016 school is likely to be busier. Airspace users in the area should be aware of the increased activity – make sure you read your AIP Supplements and NOTAMs.

This year, the airspace will differ from the standard used previously. There will be a temporary CTR during the school and a restricted area on Saturday 16 January.

The Walsh Memorial Scout Flying School has provided quality aviation training in New Zealand for budding young pilots aged 16 to 19, since 1967.

For more information, visit www.scouts.org.nz/walsh, email walsh@scouts.org.nz, or phone David Jupp on 021 476 676. ■

SMS **Update**

www.caa.govt.nz/sms

Steady progress is being made towards the introduction of Safety Management rules (Part 100). The provisional effective date of the rules is 1 April 2016 (refer to the rules for transition dates). When the rules are signed, they will be available on the CAA web site as pending rules.

The summary of public submissions received on the SMS Notice of Proposed Rule Making has been published on the CAA web site. SMS workshops to share SMS knowledge and experience were held with interested industry participants in November. Further workshops will be held next year. Additionally, formal SMS training is being considered by industry training providers. Details of workshops and training courses will be announced on the CAA web site.

Subscribe to our free email notification service to keep up to date:

www.caa.govt.nz/subscribe

There are selection lists for Part 100 and SMS. If you are an existing subscriber, you will need to add Part 100 to your selection. ■

CAA **Safety DVDs**

Want to refresh your awareness on safety issues? Perhaps you've got a friend who would benefit from a refresher?

Then check out our safety DVDs.

They're also great for a club night, especially if followed by a discussion.

Two of the most popular are *Mountain Flying*, and *Safety Around Helicopters*.

Mountain Flying gives important advice on one of the most challenging types of flying. *Safety Around Helicopters* is designed for anyone who spends any time around helicopters whether in the air or on the ground.

For a complete list of safety DVDs go to the CAA web site, www.caa.govt.nz, "Safety Info – CAA Safety DVDs". The DVDs can also be borrowed from the CAA library by emailing library@caa.govt.nz. If you want to buy them, contact Video NZ, www.videonz.co.nz. ■

How to Get **Aviation Publications**

AIP New Zealand

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

Pilot and Aircraft Logbooks

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

Rules, Advisory Circulars (ACs), Airworthiness Directives

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

Planning an **Aviation Event?**

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

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

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

CAA Cut-off Date	Airways Cut-off Date	Effective Date
21 Dec 2015	28 Dec 2015	3 Mar 2016
18 Jan 2016	25 Jan 2016	31 Mar 2016
15 Feb 2016	22 Feb 2016	28 Apr 2016

See **www.caa.govt.nz/aip** to view the AIP cut-off dates for 2015/2016.

Aviation **Safety Advisers**

Contact our Aviation Safety Advisers for information and advice. They regularly travel the country to keep in touch with the aviation community.

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Mobile: +64 27 285 2022
Email: Bob.Jelley@caa.govt.nz

Report Safety and Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY
(0508 472 338)
isi@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)
www.caa.govt.nz/report
The Civil Aviation Act 1990 requires notification "as soon as practicable".

Accident Briefs

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

ZK-HTN Hughes 369E

Date and Time:	29-Apr-2011 at 20:00
Location:	Milford
POB:	2
Damage:	Substantial
Nature of flight:	Test
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	61 yrs
Flying Hours (Total):	12672
Flying Hours (on Type):	4265
Last 90 Days:	182

The helicopter was on a test flight at night to record engine parameters following an engine change. The pilot made a vertical climb, during which the accompanying LAME made the necessary observations, then a vertical descent back to the field. The pilot reported that he misjudged the descent, and the helicopter landed heavily, breaking the left skid and rolling on to its left side.

CAA Occurrence Ref 11/1929

ZK-EFO Jabiru 230D

Date and Time:	11-Nov-2010 at 09:16
Location:	Matakana Island
POB:	1
Damage:	Substantial
Nature of flight:	Training solo

Engine failure occurred during a practice forced landing onto Matakana Island. The aircraft struck a fence on landing, resulting in a collapsed nose wheel.

Subsequent inspection of the engine found that all flywheel attachment bolts had sheared. Further investigation by the manufacturer disclosed no other defect that could have led to the engine failure, but did find that the dowels specifically intended to prevent this failure mode had failed. Any design change or modifications resulting from further research by the manufacturer were to be notified by bulletin.

CAA Occurrence Ref 10/4450

ZK-EUF NZ Aerospace FU24-954

Date and Time:	04-Sep-2010 at 13:30
Location:	Fox Glacier
POB:	9
Damage:	Destroyed
Nature of flight:	Parachuting
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	33 yrs

During takeoff the parachuting aircraft was seen to pitch up to a near vertical attitude before the nose dropped in what witnesses described as appearing like a wing-over to the left. The aircraft impacted the ground in a near vertical attitude, immediately erupting in flames.

Investigated by the Transport Accident Investigation Commission, www.taic.org.nz, ref 10-009.

CAA Occurrence Ref 10/3403

ZK-RPA

Date and Time:	17-Sep-2015 at 09:30
Location:	Kioreroa Road
Nature of flight:	Private other

A DJI 900s drone with a MTOW of 8.4 kilograms was being used commercially to film a property for a real estate company. The pilot misjudged the distance to adjacent power wires and the RPAS struck the wires causing a twist in the wires and a flashover to occur. This cut out power to 201 industrial customers for 19 minutes. The RPAS was destroyed.

CAA Occurrence Ref 15/4474

ZK-DDX NZ Aerospace FU24-950

Date and Time:	02-Jun-2011 at 12:00
Location:	Paturau
POB:	1
Damage:	Minor
Nature of flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	37 yrs
Flying Hours (Total):	5000
Flying Hours (on Type):	80
Last 90 Days:	150

The pilot was completing a fertiliser spreading job, comprising four runs per load. On the third run of a load, the pilot altered course to avoid a bush-covered hillside, entering a long gully that was also to be treated. As the aircraft descended to sowing height, it struck two wires strung across the gully. The aircraft was damaged but able to return to the strip for landing. The pilot recalled that he knew the wires were there, but they went undetected due to the unplanned changes to the sowing run.

CAA Occurrence Ref 11/2481

ZK-NPK Cessna 152

Date and Time:	23-Jun-2015 at 10:40
Location:	Matamata
POB:	1
Damage:	Substantial
Nature of flight:	Training solo
Age:	30 yrs
Flying Hours (Total):	14
Flying Hours (on Type):	11
Last 90 Days:	14

During landing, following the second circuit of their second solo flight, the student failed to hold sufficient back pressure on the elevator which resulted in the aircraft landing heavily on the nose wheel. The aircraft bounced and landed heavily again on the nose wheel which caused the nose landing gear to fail. Once the aircraft had come to rest, the student was able to vacate the aircraft uninjured.

Following the accident, the student is continuing with advanced dual training exercises, until the student and the training provider are confident with the student's abilities for further solo flight.

CAA Occurrence Ref 15/3050

ZK-HRJ Robinson R22 Beta

Date and Time:	25-Feb-2015 at 08:15
Location:	Akitio
POB:	1
Damage:	Destroyed
Nature of flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Helicopter) Private Pilot Licence (Helicopter)
Age:	38 yrs
Flying Hours (Total):	5868
Flying Hours (on Type):	773
Last 90 Days:	62

The pilot was conducting routine tasks moving equipment on a hill country station, and used the opportunity to test spray equipment fitted to the helicopter. After conducting the test run on a ridge, the pilot turned into the adjoining valley and commenced descent.

The engine lost power soon after starting the descent, and the helicopter struck the top of some trees, coming to rest approximately 20 metres down the slope from where it first made contact with the treetops.

Subsequent engineering analysis of the helicopter found no evidence of mechanical failure, or any other abnormality that could have contributed to the accident.

Weather data for the area at the time of the accident shows the atmospheric conditions conducive to moderate to severe carburettor icing.

Given the atmospheric conditions, aircraft configuration, and the apparent normal operation of the engine prior to the accident, the most likely cause of the engine power loss was carburettor icing. A Safety Message has been published on the CAA web site to remind pilots of the dangers of carburettor icing, see www.caa.govt.nz/safety_info/safety_messages.html.

CAA Occurrence Ref 15/745

Cessna 172A

After getting airborne, the aircraft lost power. Due to the built-up area to the north of the aerodrome, the pilot elected to do a reversal turn and landed back onto the parallel grass vector. The fault was established as possible sticky exhaust valve.

CAA Occurrence Ref 13/6524

GA Defects

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

Gippsland GA8

Left Magneto

Part Model:	12011068
Part Manufacturer:	Champion Slick
Part Number:	6393
ATA Chapter:	7410
TSI Hours:	194.2
TTIS hours:	694.2

On closing the throttle at touchdown the engine stopped and could not be restarted.

Maintenance investigation found that the left-hand magneto coil was open-circuit, resulting in the magneto being inoperative. The internal timing was also found 1.5 degrees retarded due to partial failure of the main contact assembly, the retard contact assembly was found burnt, and retard timing 3 degrees retarded. The magneto had accrued 194.2 hrs TSI and 694.2 hrs TTIS.

The right-hand magneto was found with the timing at 26 degrees BTDC and the internal timing had shifted 11.5 degrees advanced, the points gap was 0.014". The right-hand magneto had accrued 91.3 hours TSN, the previously fitted magneto was changed for similar timing issues. It was returned to Champion Slick for warranty replacement.

The left-hand magneto was repaired IAW Champion Manual L-1363 Rev F using new contacts and coil.

Lycoming published Service Letter L264 on 17 March 2015 that provided a reprint of Champion Slick Service Letter 4300/6300-74-20-001 dated 18 February 2015. This service letter provides some guidance on actions to be taken if magneto timing is found incorrect at annual or 100-hour inspections.

CAA Occurrence Ref 15/1689

Pacific Aerospace 750XL

Top Rudder Attachment

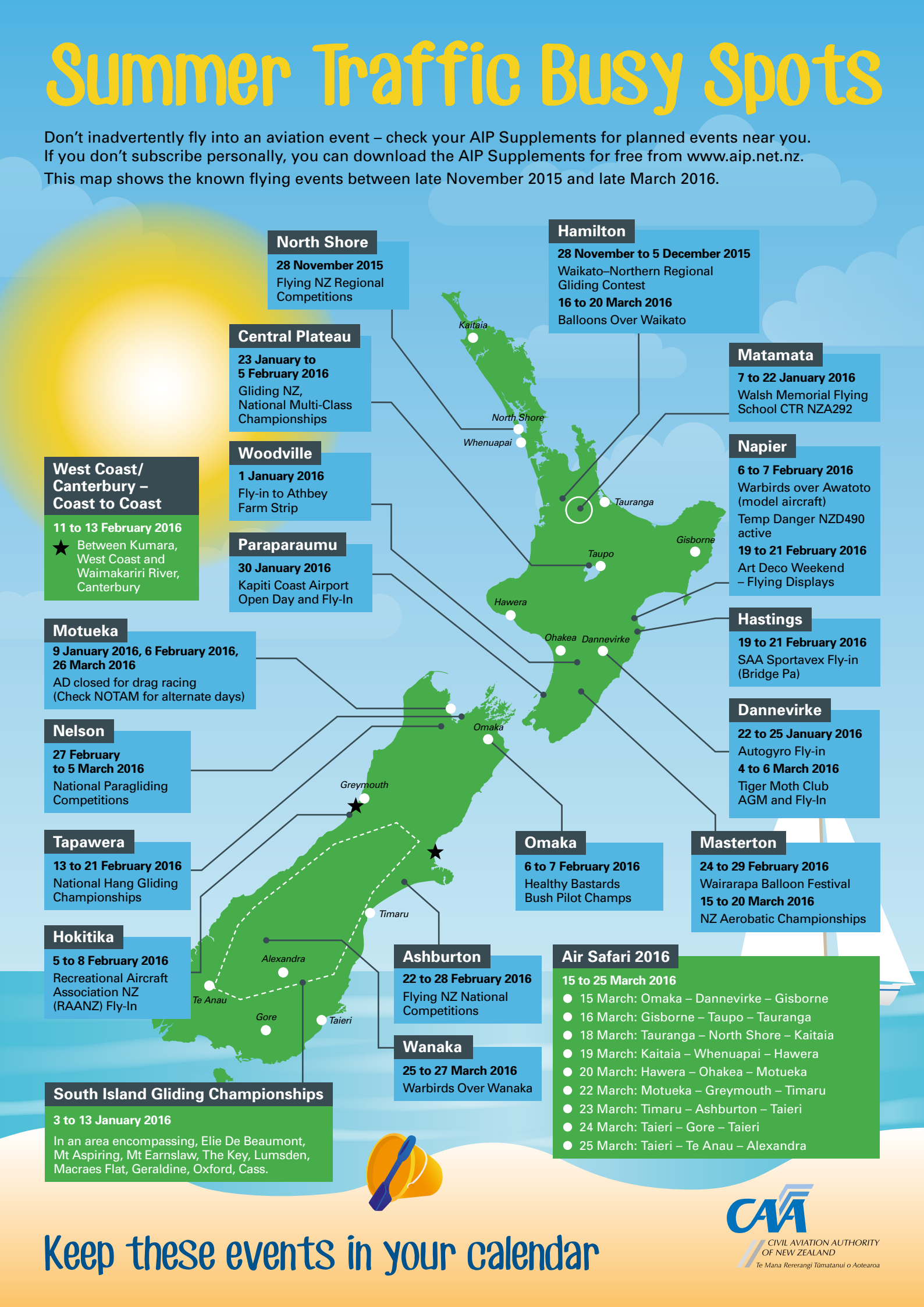
Part Model:	750XL
Part Manufacturer:	Pacific Aerospace
Part Number:	11-33075-1
ATA Chapter:	2721
TTIS Cycles:	1087
TTIS Hours:	4902.9

While the aircraft was in for major modifications, a lack of rudder travel was noted. The top rudder attachment was found to be mounted backwards, fowling the bracket, and not allowing full rudder travel. The bracket was reinstalled to the correct position.

CAA Occurrence Ref 15/4430

Summer Traffic Busy Spots

Don't inadvertently fly into an aviation event – check your AIP Supplements for planned events near you. If you don't subscribe personally, you can download the AIP Supplements for free from www.aip.net.nz. This map shows the known flying events between late November 2015 and late March 2016.



North Shore
28 November 2015
Flying NZ Regional Competitions

Central Plateau
23 January to 5 February 2016
Gliding NZ, National Multi-Class Championships

Woodville
1 January 2016
Fly-in to Athbey Farm Strip

Paraparaumu
30 January 2016
Kapiti Coast Airport Open Day and Fly-In

West Coast/ Canterbury – Coast to Coast
11 to 13 February 2016
★ Between Kumara, West Coast and Waimakariri River, Canterbury

Motueka
9 January 2016, 6 February 2016, 26 March 2016
AD closed for drag racing (Check NOTAM for alternate days)

Nelson
27 February to 5 March 2016
National Paragliding Competitions

Tapawera
13 to 21 February 2016
National Hang Gliding Championships

Hokitika
5 to 8 February 2016
Recreational Aircraft Association NZ (RAANZ) Fly-In

South Island Gliding Championships
3 to 13 January 2016
In an area encompassing, Elie De Beaumont, Mt Aspiring, Mt Earnslaw, The Key, Lumsden, Macraes Flat, Geraldine, Oxford, Cass.

Hamilton
28 November to 5 December 2015
Waikato–Northern Regional Gliding Contest
16 to 20 March 2016
Balloons Over Waikato

Matamata
7 to 22 January 2016
Walsh Memorial Flying School CTR NZA292

Napier
6 to 7 February 2016
Warbirds over Awatoto (model aircraft)
Temp Danger NZD490 active
19 to 21 February 2016
Art Deco Weekend – Flying Displays

Hastings
19 to 21 February 2016
SAA Sportavex Fly-in (Bridge Pa)

Dannevirke
22 to 25 January 2016
Autogyro Fly-in
4 to 6 March 2016
Tiger Moth Club AGM and Fly-In

Omaka
6 to 7 February 2016
Healthy Bastards Bush Pilot Champs

Masterton
24 to 29 February 2016
Wairarapa Balloon Festival
15 to 20 March 2016
NZ Aerobatic Championships

Ashburton
22 to 28 February 2016
Flying NZ National Competitions

Wanaka
25 to 27 March 2016
Warbirds Over Wanaka

Air Safari 2016
15 to 25 March 2016
- 15 March: Omaka – Dannevirke – Gisborne
- 16 March: Gisborne – Taupo – Tauranga
- 18 March: Tauranga – North Shore – Kaitaia
- 19 March: Kaitaia – Whenuapai – Hawera
- 20 March: Hawera – Ohakea – Motueka
- 22 March: Motueka – Greymouth – Timaru
- 23 March: Timaru – Ashburton – Taieri
- 24 March: Taieri – Gore – Taieri
- 25 March: Taieri – Te Anau – Alexandra

Keep these events in your calendar

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa