

vector

ROTARY VISIBILITY ISSUES



“A virus
won’t stand
in the way of
my dreams.”

Flight training
lessons after
lockdown

Advice
from ADS-B
equipped pilots





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// "A VIRUS WON'T STAND IN THE WAY OF MY DREAMS."

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ISOLATED AND VULNERABLE

Two fatal accidents in 2017 highlight the critical need for low-hour pilots to ‘hang out at the club’ getting much-needed guidance from older, wiser flyers.




The two accidents were separated by just seven days. CAA safety investigation report 17/1785 outlines the stark facts of one of them, near Pio Pio in the Waitomo district of the North Island.

“The gyroplane was witnessed conducting a series of low-level manoeuvres before suddenly losing height and impacting terrain.”

CAA Safety Investigator Lou Child found the pilot “was conducting flying manoeuvres outside of his capability, and well below the prescribed minimum safe heights.”

She concluded that a handling error by the inexperienced 25-year-old pilot “most likely led to a rotor stall and loss of lift.” Her investigation could not establish definitively what caused the pilot to do what he did.



// In the first of two similar accidents in April 2017, this RANS S-6 microlight crashed near Balclutha.

No-one to kick things around with

The tragedy cannot be dismissed, however, as beginning and ending as pilot error.

As Lou examined the circumstances of the accident, she found elements in common with other recent catastrophic events.

“It so happens that in this case, the aircraft was a gyroplane. But we’ve investigated both fixed-wing and helicopter accidents with factors in common with this one,” she says.

“The first of those factors – and this is crucial – is that this pilot had no mentor. Because he owned his own machine there was no-one looking out for him.

“The other pilots at his local aerodrome were flying other types of aircraft and he had no like-minded pilots to kick things around with.”

Similar contributors, same tragic end

A double fatality near Balclutha only a week before involved the pilot of a RANS S-6 microlight who was also newly certificated, also operating in a remote area, and briefing and debriefing with a distant instructor on the phone.

Report 17/1635 on the Balclutha tragedy notes that evidence at the accident scene was consistent, again, with “an unrecovered aerodynamic stall at low level”.

This pilot also owned his own aircraft, flew to and from his own airstrip and was, once again, isolated from more experienced pilots.

// Hanging out at the club... is “crucial in transferring tacit information from more experienced aviators to those lesser experienced” .//

The terrible combination of isolation and challenging airstrips

The Sport Aviation Corporation (SAC) says remote pilots operating from their own strip in their own machines are always more at risk than other more ‘connected’ aviators.

SAC Operations Officer David Readman says private strips often have challenging features – particularly for the inexperienced pilot.

“Usually these private strips are shorter, sloping, and are generally in hilly regions,” David says.

“They have unpredictable winds, and the approaches are more hazardous; many being one way in or out.

“These factors combine with the pilot’s remoteness – which means any learned bad habits are being embedded in their flying – to increase the risk of a catastrophe.”

Hanging out at the club is crucial

Report 17/1635 includes the findings of a Finnish study that traditionally, recreational aviation is a highly communal activity.

Hanging out at the club and exchanging experiences, it notes, are “crucial in transferring tacit information from more experienced aviators to those lesser experienced”.

Lou Child says low-hour pilots, particularly if they’re flying in remote areas, should seek out advice and help from more experienced flyers.

“Getting a licence or certificate means only that you know the basics – but really, they’re a certificate or licence *to learn*.

“That means recognising your lack of ability, and making some effort to get guidance from experienced pilots as you build hours.”

Be your own devil’s advocate

In the Spring 2019 issue of *Vector*, the article “Flying near Mount Stupid” noted the opinion of some safety experts that there are four levels of pilot competence.

A level one pilot – newly qualified and low-hour – is so inexperienced they don’t even know what they don’t know. At the other end of the competence spectrum are the level four pilots, who’ve reached the apex of flying skill and can handle normal, abnormal, and emergency procedures.

The problem, the experts say, is that a level one pilot can often feel like they’re a level four ‘natural’. They don’t have the smarts yet to understand they have a lot to learn and should take things slowly and carefully.

Social psychologist David Dunning advises low-hours pilots:

“Be your own devil’s advocate. Ask yourself how you might be wrong, or how things might turn out differently from what you expect ... consider ‘the opposite’. Seek advice.”

The role of currency

A second factor common to both 2017 accidents was the pilots’ lack of currency or experience in their machines.

The type of gyrocopter the 25-year-old was flying, according to Lou Child, isn’t an easy aircraft to fly, compared with more modern designs.

On top of that, he’d hardly flown it.

“He’d started off enthusiastically training at Tauranga – but after he got his intermediate certificate, he appeared to lose interest,” says Lou.

“He put the gyro in the hangar and hardly ever flew it. Then he decided, after about a year, to give it another go. He did his flight check in Tauranga, which went extremely well, considering he hadn’t flown for such a long time.”

Nevertheless, his examiner, while quite amazed at the pilot’s skill, did warn the young man that he must “fly more”.

“There were another 11 days without flying,” says Lou, “then the day of the accident.

“If he’d been part of an organisation, or a club, his lack of currency would have alarmed them. They would have likely recommended going up with an instructor a few times, or just flying in the circuit to start with.”

The role of experience

The pilot in the Balclutha accident was also inexperienced. He had a total of 99 hours; 60 as pilot-in-command.

The report into the accident notes, “Without the support of more experienced pilots around them, the inexperienced pilot is at greater risk of misjudging hazardous conditions or actions. Significant flight experience allows a pilot to be alert for potential threats to their safety. The inexperienced pilot, however diligent, may not recognise or fully understand the implications of a set of circumstances or actions.”

Rodger Ward, from the Recreational Aircraft Association of New Zealand (RAANZ), agrees that most experienced aviators can quickly tell if an aircraft is doing something that doesn’t look right – even if they don’t have experience on it themselves.

“RAANZ relies quite heavily on eyes and ears at a local

club level to ensure any unusual behaviour is noticed early, and nipped in the bud,” Rodger says.

He regards ‘hanging out at the club’ as priceless.

“In my local club rooms there’s a big table and the amount of informal learning that takes place there is immense.”

Rodger says he would strongly encourage any aviator, no matter what or where they fly, to speak up if they see anything “untoward”.

The role of contact with others

There were factors unique to each of the 2017 accidents. The normally quiet and careful gyrocopter pilot had recently begun a course of medication that may have had an unanticipated effect on his mood, possibly encouraging reckless flying.

The Balclutha pilot flew directly into poor weather.

“Nevertheless, each of these elements would also have been mitigated to a certain extent,” says Lou Child, “by contact with other pilots.”

Make an effort if you’re inexperienced, and if you’re experienced

“If you’re new to aviation and flying remotely, you must make the effort to spend time with other aviators,” says Lou.

David Readman says club fly-ins and weekend flying trips might provide that opportunity.

“We at SAC are going to promote these a little more, New Zealand-wide, so pilots operating remotely are aware of these events, and are encouraged to join in.”

Lou Child agrees with Rodger Ward that experienced pilots have a role to play in keeping an eye out for less-skilled aviators.

“If you know that Farmer Bloggs around the corner is a fresh PPL and has just bought themselves an XYZ aircraft,” she says, “and you’re, say, an ag pilot, maybe keep an eye on them, maybe offer some guidance.”

Rodger says in his experience, such advice is usually accepted with grace.

“But occasionally we do have people, quite new to the sport, who demand you show them where in the rules the advice on airmanship that you’re giving them is written.

“But I would say it’s wise to listen to what 100 combined years of airmanship is saying.” ➔

“A VIRUS WON’T STAND IN THE WAY OF MY DREAMS”

The aviation career plans of the 2020 Young Eagles have been upturned by COVID-19. But they’re a resilient bunch who’re nonetheless looking positively to the future.



// Present and past Young Eagles competing at the 2020 Flying NZ national champs gathered for Vector in front of the former National Airways Corporation de Havilland DH 114 Heron, ZK-BBM "Matapouri".

At rear (L-R) Gemma Douglas, Scott Wright; Third row (L-R) Ross McFadzean, Kalarn Mark, Holly Lyttle; Second row (L-R) Levi Daniel, Braydon Mackey, Joe Carter, Stephanie Redepenning, Jannik Wittgen, David Pribis; Front: Adam Hancock

It may be the sunniness of youth, but the 2020 Young Eagles appear relatively unfazed by COVID-19.

Those who attended Flying New Zealand's national championships at Tauranga in February seem only more determined to achieve their long-held aviation goals.

And anyone who knows one, knows there's nothing like a determined Young Eagle.

Sixteen-year old Ross McFadzean is a 2020 Ross Macpherson Memorial Scholar¹. At the national champs he also won the Nola Pickard Memorial Trophy for a series of aviation tests, open only to Young Eagles.

He's positive about the future.

"It took time after the 9/11 tragedy, but demand for air travel did eventually surge."

Ross also sees opportunities in long-term airline pilots possibly retiring due to the downturn, and he's also cheered by Boeing predictions that 804,000 new civil aviation pilots will be needed by 2038.

"There'll be something exciting for me in aviation."

Joe Carter won the 2020 Kirk Samuel Dakers scholarship and is keen on becoming a career instructor.

"My passion to pass on knowledge won't fade, despite the pandemic's effects. The aviation community is resilient and will recover in due course."

Joe's looking forward to going solo on his 16th birthday in August.

"During lockdown I studied for my theory exams – so the lack of flying motivated me even more to get some PPL study in."

Seventeen-year-old David Pribis, from South Canterbury Aero Club, was also a 2020 Macpherson scholar. He says COVID-19 hasn't altered his plans much.

"The commercial sector has never really appealed, because of the longer hours and time away from home. I've always been more interested in aeronautical engineering.

"But I see flying as a way to understand aircraft better and maybe open the doors to a nice hobby in the future. It's also extremely fun!"

At 14, Kalarn Mark was the youngest Young Eagle at the champs. But he's been flying for almost three years at Tauranga Aero Club.

"It's very sad to see the brutal hit aviation has taken, with so many skilled pilots out of work. Personally, I must remain positive about the things that I can control.

"My goal is to be an international airline pilot, and jobs will be scarce for a while, but it's a matter of standing out from the rest. That means being the very best version of myself – academically as well as in aviation.

"A virus won't stand in the way of my dreams," says Kalarn.

Another Macpherson scholar, 17-year-old Stephanie Redepenning from Canterbury Aero Club, is working towards becoming a pilot for a flying doctor service, or the Mission Aviation Fellowship. "Aviation and assisting people in distress will always be on my heart." Stephanie is also "definitely" looking at instructing, possibly even longer term.

"COVID-19 hasn't really disrupted those plans but it has reinforced the importance of having a Plan B, for when things don't turn out as expected.

"I'd consider becoming an aircraft maintenance engineer or police officer, but maintenance job opportunities may also become hard to find."

Braydon Mackey, also a Macpherson scholar, already has a Plan B. The 17-year-old says the pandemic has altered his pathway to a career with an airline, but he's still determined to get there.

"I might apply to the police force or fire service and at the same time, work towards my PPL and CPL. Then I'll try the airlines.

"Flying will always be in my blood!"

Levi Daniel was the top-scoring 2020 Macpherson scholar. Not really interested in an airline job, he's a fan of general aviation.

"It's a unique, cool part of the industry."

So the young North Shore pilot is considering career instructing.

"It would be awesome to teach something I'm so passionate about to people who're equally passionate."

Like the other Young Eagles, Levi's optimistic that normality in aviation and tourism will return eventually.

"Stronger than ever!"

Not a Young Eagle anymore, but hanging out with them in Tauranga, was 19-year old Holly Lyttle, the 2019 Waypoints scholar.

In 2020 Holly won the Newman Cup for women's precision circuits, and the senior landing competition.

"I'm only a couple of months away from sitting my CPL, and after that it's hopefully a C-cat, and then instructing. »

¹ Five or six Ross Macpherson Memorial Scholarships are awarded to Young Eagles each year for flying lessons, underwritten by the CAA, Airways, Avsure and Aspeq.

» “I’m prepared for the industry to be slow for a while and finding that first job might be very tough, but COVID-19 hasn’t affected my love for aviation. I’ll just keep going with my training.”

Seventeen-year old Gemma Douglas is a former Macpherson scholar, from North Shore Aero Club.

She does feel like COVID-19 has left her a bit unsure about her future in aviation.

“I was initially going to join the air force, and I got into the Schools for Skies programme, but it was postponed because of the pandemic.

“If my air force plans don’t work out, I’m considering an aviation degree, while the industry gets on its feet.

“One thing I am sure about, is that aviation in some form is still my future.”

Adam Hancock, from Mid Canterbury Aero Club, took second place in the Airways competition for flight manoeuvres, at Tauranga.

He wants a career in aircraft engineering.

“I still feel really positive because aircraft will still need to be flown and they will need to be maintained.”

Young North Shore pilot Jannik Wittgen won the 2020 Waypoints scholarship and was third equal in the CAA trophy for preflight checking.

His planned career as an aeronautical engineer is still on course.

“I met an aeronautical engineer last year and he told me about how he test flies planes that he’s designed and engineered – and I just thought, ‘that’s what I want to do.’”

“I’m hoping that during the four years I’m studying engineering at university, aviation will have made some sort of recovery.”

Scott Wright was a Ross Macpherson scholar in 2018, and while no longer a Young Eagle, spent time with the 2020 group at Tauranga.

He came third-equal in the CAA competition for preflight checking.

His plans for aviation have been put on hold while he watches what happens.

“I’m going to do science at the University of Canterbury next year, but I’ll still carry on to get my PPL and CPL to have ready for when the aviation industry needs new pilots again.” **↳**

BACK TO THE FUTURE WITH SMS

// By Neil Richardson, Verda Consulting, UK

With the damage done by COVID-19 to aviation businesses, it would be understandably tempting to ‘release the safety brakes’ as restrictions ease. But deterioration of safety standards might only lead to more business losses.

Changing hazards

COVID-19 has shaped a new era. In light of those changes, your safety management system should be responding appropriately.

New hazards may have been introduced due to the COVID-19 situation and they will need new and appropriate control measures.

For instance, physical distancing, and how that applies to *your* operation, will need to be carefully thought through. The properties of existing hazards and how they interact with other elements of your system may have changed so their control will need reviewing and possibly adjusting. For example, physical distancing measures may cause some human factors issues with preflight planning and shift handovers.

Some new hazards may take time to become evident while some may no longer be present. Whatever the case with your organisation, the ‘new normal’ will almost assuredly mean looking at the nature of the hazards in your operation and making sure their associated risk is effectively managed.

Think about your service providers

Many commercial operators are dependent on other providers such as aerodromes or ground handling contracting companies to deliver their services. Some of those service providers may need a bit of time to get back to their previous levels of performance. **»**



Photo courtesy of Eastland Heli Services.

// New hazards may have been introduced due to the COVID-19 situation and they will need new and appropriate control measures.

That means, while you, as the operator, are ‘open for business’, your service provider(s) may have limitations you need to consider carefully.

For example, an airfield that had to close during the worst of the pandemic, may have experienced reduced wildlife control activities.

Wildlife, particularly birds, may be more prevalent which is likely to have attracted new predators. Those predators may have damaged fences or other barriers. This may take time for your aerodrome to get under control, and also work through possible emerging issues, such as how to deal with a protected species, that’s made a new home there.

Consider your people

It’s likely there’ll be emerging issues post-COVID-19, from the introduction of new tasks, such as maintaining physical distancing, which could be a distraction to staff. You’ll have to build the awareness of those issues among participants and employees, and build their skills to cope.

Upholding physical distancing measures requires active participation by all employees; this is a skill in its own right and may involve conflict resolution skills which not everybody is comfortable with.

It’s often assumed that staff can easily cope during change, but human error is very typical of under-resourced operations and those undergoing or that have undergone change.

Your staff could be worried about the impacts of COVID-19 – such as financial hardship – concerns about relatives or colleagues, stress, and fatigue brought about by unfamiliar and changing tasks, extended working hours, and competing priorities. These can all increase the risk of errors.

The staff levels you need now may be different from those needed before the outbreak of COVID-19. It’s key to match the resources you have to any new risk control measures.

The right balance

In a time when the need to recover financial losses is pressing, it would be very easy to prioritise production. Your leadership, and its messaging regarding safety, must ensure you have the right balance between production and protection.

We all need to be vigilant during and after change. Each organisation will face unique challenges to returning to operations, and at times, change will be fast-paced with maybe many temporary situations arising before things settle down. Prepare for change now, engage with your suppliers, don’t underestimate how small changes can affect your operation, and ensure safety is on the agenda.

Focusing on your safety management system and remaining constantly curious about what this new era means for your safety standards will serve you well in the coming months.

More information

To read more about human factors, visit aviation.govt.nz > Safety > Human Factors.

This article was written before New Zealand moved to Alert Level 1. For the latest information on COVID-19, visit aviation.govt.nz > COVID-19. [↗](#)

Neil Richardson has been a consultant in safety management for 15 years, particularly in complex safety-critical environments, including in civil and military aviation.



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ROTARY
VISIBILITY
ISSUES
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Fatal helicopter accidents due to poor visibility are second only in number to mast bumping, and the stats are not reducing. Fixed-wing pilots, also, will find the following stories and lessons relevant.

Near-disaster in white-out

In November 2019, a pilot came within 200 feet of the ground after going IIMC (inadvertent instrument meteorological conditions).

“It was an ag spraying operation. I waited for some early morning valley fog to rise, and then took off.”

As he flew up the valley, the pilot found the high ground in front of him still shrouded in cloud.

“I wasn’t going to get through, so decided to wait it out back at the hangar. But as I did a 180 turn, I allowed the aircraft to climb and enter the cloud. I really wasn’t expecting that.

“I should have immediately lowered the collective and just dropped down. Unfortunately, I saw a patch of blue ahead and above me. It was my only reference; a false sense of security. So rather than dropping down, in my alarm I headed for that gap.

“I got further and further into the cloud, and pretty quickly that blue disappeared. I was in total whiteout.

“I was trying not to move the controls, to keep the aircraft as stable as possible, hoping it would just ‘pop out’ of the murk.

“But even if you hold the controls very still, if you don’t have any references, a helicopter will quickly wander off course. It’s the nature of the machine to be ‘dynamically unstable’.

“I knew I was losing orientation but could not sense which way the aircraft was going. My artificial horizon started to show pitch and roll. But not being current with its use, and in the stress of the moment, I struggled to understand what it was telling me.

“I tried to use the instruments, and quickly came to understand just how hard it is to suddenly transition on to them under duress. I’d been told this before, but really didn’t appreciate how hard it would be.

“When I did try a couple of little control inputs to go on to the instruments, I wasn’t confident I was making the right ones. Because of my lack of currency and in my panic, I think I got it backwards. I was expecting a disaster – a ground impact at any second.

“After what felt like an eternity – but was probably about 20 seconds – the aircraft exited the cloud, perhaps 200 ft AGL.

“My tracking showed I’d travelled quite some distance from where I’d entered the cloud and had flown a large right-hand arc. I ended up over a high river terrace, and landed safely in a paddock.”

Lessons learned

“I don’t take anything lightly now. My first mistake was to take that 180 turn too casually, and not give it the attention it required.

“I now consider ‘what if’ scenarios. If I’d given ‘what if’ some thought, I may not have irrationally headed for that blue hole, instead of lowering down to what I knew was 1000 feet of clear sky.

“I would advise anyone to keep current on instruments, even those of us who have no intention of doing instrument flying. My story shows why it’s essential. Currency on instruments is perishable so it needs to be kept up – maybe built into annual check flights.”

The stubborn stats

CAA Intelligence Analyst Joe Dewar says that, as a category of accident or incident, visibility-related accidents are extremely dangerous.

“Between 2000 and 2019, there were 27 reported accidents due to poor visibility,” says Joe. “A high proportion – almost 40 percent – were fatal.

“In addition, many of the reported visibility-related incidents have come extremely close to turning into accidents.”

Inadvertent IMC – the big killer

Of all the visibility occurrences, which include those caused by optical illusions, night vision issues, even a dirty windscreen, the most lethal are those related to inadvertent IMC.

“There are periods of degraded visibility and low cloud not suitable for VFR operations,” says former CAA Flight Operations Inspector (helicopter) Jason Frost-Evans.

“If you forge on in those conditions, you’re compromising your safety margin and are potentially just a moment of inattention from disaster. If you make a habit of it, the increased exposure increases the odds of something going wrong.”

One pilot who knows exactly what Jason is talking about told *Vector* this story:

“I started out quite a conservative pilot but over the years, as my confidence grew, so did my complacency.

“I ended up eating into my safety margin until, one day, the smallest distraction almost led to disaster. »

» “The day before, weather had stopped me completing a job, so I was feeling pressure from the client to get the job done, and efficiently. So I was looking for any way I could to take the most efficient route. And as a result I was pushing the weather.

“I was attempting to get over a little ridge. And as I was approaching the ridge I slowed down, slowed down, slowed down. But in my mind I was still fine.”

About a week earlier the pilot had “got away with a close-ish call”.

“So I thought to myself, ‘I’ve got this nailed. I’m a good pilot and, as long as I’ve got a tree as a reference, there’s no way I can go inadvertent IMC.’”

The helicopter tracked along the ridge at about 30 knots in marginal conditions. The pilot, however, had his tree at about 4 o’clock. And he could see ahead – despite the rain and deteriorating visibility – the outline of a ridge. He felt “perfectly fine”.

Then an extraordinary thing happened. The passenger leaned forward and scratched his backside, obscuring the pilot’s vision.

“That was the single thing that meant I was toast. When he leaned forward I lost my visual reference up ahead. So I turned around to find my four o’clock reference had disappeared into the cloud.

“I turned my attention back and the hole up ahead had also gone.”

Over the next ten or so minutes, the pilot flew blind in cloud.

“I spent a few seconds uncontrolled, my feet going all over the place, my cyclic bouncing left and right. And then I applied forward full power and waited for a positive rate of climb. And then I had nothing to do. I’d done all I could and I remember massive G forces. I was looking down through the bubble between my feet, just seeing grey, and waiting for the trees to smash through.”

The pilot was not trained in IMC conditions, except for a couple of hours during CPL training. But instinct took over. His was a powerful machine and he was very familiar

with it. He immediately made good use of his GPS. And he’d ‘caged’ the artificial horizon during the preflight.

After three episodes of climbing and descending in whiteout, while the airspeed careened between 40 and 140 knots, the machine finally popped out of the murk at 14,000 feet.

“I was at a point in my career where I was cocky and complacent and operating right on the line. I’d had that close call a few days earlier but I’d got away with it. And that reinforced to me that I was awesome.

“So I was really comfortable with eroded safety margins. But I almost killed someone because they leaned forward and scratched their bum.”

Even years later, the pilot still flies to the legal minimums.

“If you’re operating to the legal minimums, you’ve got plenty of scope to mess up without getting yourself into a situation.

“That’s why we have met minima.”

Check the weather

Jason Frost-Evans says pilots should take their flight planning seriously.

“There are still people whose weather check is the television news the night before a flight. They depart not knowing what the visibility is forecast to be, or when a front is predicted to come through.

“But it’s not hard to get a good picture of what the weather’s going to do. We’ve got plenty of valuable planning services in New Zealand, but your primary source should always be MetFlight GA.

“There are good products to indicate what heights the cloud is going to be at, and you can call people and ask what the local weather is like, or there are webcams to check.

“Don’t just accept it’s going to be ‘a nice day’. Check what’s going to happen throughout the day. Have a back-up plan should the weather change suddenly. You can pretty much land in a few minutes anywhere in New Zealand.

“Be ready to make a timely decision to avoid poor weather.

“And if you do experience un-forecast poor weather, close the loop and report it, so everyone can benefit from improved services.”

Riaan Botha, chief pilot with Auckland-based Heletranz Helicopters, agrees, saying weather doesn’t just ‘happen’.

“There’s usually a pretty good forecast. Even when you’re flying, conditions don’t change in the blink of an eye, so leave yourself with options.

// If you’re operating to the legal minimums, you’ve got plenty of scope to mess up... //



// Make weather decisions early.

Photo: istockphoto.com/helivideo

“You’ve always got an opportunity to plan, so plan. Always have a Plan B. And possibly a Plan C as well.”

The chairman of the New Zealand Helicopter Association, Scott McKenzie, says too few pilots train in bad weather.

“I’m surprised how few pilots have flown in poor weather during their training. They’ve not had to make weather decisions while under close supervision.

“Training organisations need to fly their students in poor weather to ensure that the student learns to make good weather decisions.”

Decision-making

Scott McKenzie says good judgement regarding weather comes down to experience, confidence, and good preflight planning.

“During one flight I was observing, the passenger almost talked the pilot into continuing when the weather was unsafe for the task – ‘it’ll probably clear up by...’.

“The pilot was going to continue, then knocked it on the head. The CRM with the client was really interesting.”

Scott says good decision-making competes with the pilot’s mindset that “an experienced, well-respected pilot gets the job done”.

“I’ve always been taught, and have taught, ‘if there’s any doubt, there’s no doubt’.

“The great benefit of helicopters is that you can land. The ‘land and live’ initiative by Helicopter International is great, although hard to do if you have the wrong mindset. Don’t be too proud to realise you’ve made the wrong decision and land or turn around.”

Scott says a preflight risk assessment can take less than two minutes, can set minimas appropriate for the task and assist CRM. It’s the start of a conversation to mitigate any highlighted risks.

“An option for regular clients is informing them of your minimums. For example, ‘we’ll maintain a cloud base greater than 1500 ft AGL, 5 NM visibility, fuel duration of two hours and minimum fuel of 100 lbs’. It really assists the good conduct of the flight and manages your overlapping duties.

“Then make decisions early. Fly 200-300 ft below the cloud base to increase forward visibility and situational awareness, and that will help you with making good decisions.

“If you need to slow down, be aware of the tendency to balloon and climb into the cloud, especially during a turn.”

Optical illusions

In 2009 CAA Flight Operations Inspector (helicopter) David Oliver faced an acute visibility issue while flying in Australia.

He was helping a more experienced pilot fly mine workers around the Outback.

“I hadn’t flown in that kind of dusty environment at that time, and I’d considered the ‘brownout’ a bit of a myth.

“I was following him in to land, and he must have gone over a little dustpan and landed on slightly rocky terrain. He kicked up a little bit but nothing too bad. And then I came in behind him intending to land on the point he’d indicated. »

» “But as I settled in the hover, and looked out, it was like a river of chocolate milk running over the skin. I couldn’t see my reference to the right and I had the illusion that I was going forward at about 20 knots.

“I was ready to pull backwards when suddenly there was a little gap in the ‘river’ and I saw a stationary rock. As soon as I saw that, I lowered the collective and bumped onto the ground.

“But had I not seen that rock, I would have definitely pulled backwards and probably ended up smashing the tail into the ground.”

In hindsight, David says he should have chosen a path where he could have gone around.

“Much like the pilot in front of me probably did. If you keep a little bit of airspeed, it only takes 15 or 20 knots to keep in front of that brownout, and that’s probably exactly what he did. So it wasn’t so bad for him. But I got to a point where I couldn’t do that because he was in front of me. I should have given myself more space so that I could abort and fly through.”

The lethality of calm water

Not all illusion situations end so well. The CAA investigated the circumstances of a fatal helicopter accident in Lake Sumner in 2012 (CAA occurrence 12/2242).

Safety Investigator Peter Stevenson-Wright found that the Hughes 369D flew into the lake, north-west of Christchurch, with “considerable force and forward speed”.

The helicopter wreckage was later found in the lake ‘on track’ to its next planned spray zone.

The report concluded the probable cause of the accident was controlled flight into terrain (the lake) due to spatial disorientation¹, specifically relating to somatogravic illusion and false horizons. They were exacerbated by the mirror-like quality of the lake’s calm surface.

“We believe the pilot unknowingly flew a shallow descending flight path,” says Peter Stevenson-Wright, “due to a lack of visual cues over the lake.”

Peter says pilots operating in conditions where there’s little definition because of featureless terrain, should be mindful of possible illusions.

“I would encourage pilots to read the ATSB article referred to, below, and get to know some of the ‘drawbacks’ of the human brain.”

Keep current on instruments

Another area ripe for optical illusions is VFR night flying. Riaan Botha, who frequently flies after dark – including turning away from the lights of Auckland and toward the ‘black hole’ of rural areas – says currency is the most important factor in night flying.

“We have about four pilots who are instrument-rated, but we keep all our VFR pilots current in night flying as well. It’s definitely a whole different ball game if you haven’t done it for a while.”

One of those things is being able to rely confidently on instruments.

1 Go to atsb.gov.au and search for report B2007/0063 "An overview of spatial disorientation as a factor in aviation accidents and incidents".



Photo from CAA occurrence report.

// The surface of Lake Sumner two hours after the accident.

“Night flying creates illusions. Your brain might tell you one thing, but your instruments will tell you something else, so you really have to trust your instruments.”

NVIS complacency

Over the last five years, a number of incidents have been reported relating to the inappropriate use of a night vision imaging system (NVIS).

Jason Frost-Evans believes the main risk comes from pilots thinking that NVIS is going to protect them from poor decisions to a far greater degree than it can.

“Like any other new system, it can lead to a false sense of security.

“For instance, flying with an NVIS sometimes encourages pilots to push the weather,” he says.

“Push it too far and you’re in a worse position than you would have been without NVIS.”

Jason also says appropriate and complete training in NVIS is crucial.

“Like other systems added to a basic aircraft to improve flying safety, NVIS is great unless it’s used incorrectly. Proper training is critical.

“In a modern air ambulance aircraft, for instance, you’ve got systems working together to reduce a pilot’s workload. But the pilot has to have a full understanding of exactly what the systems are doing, and what they’re indicating.

“If you start to get behind the systems, or don’t understand them correctly, it can actually add to the complexity of flying.”

Windscreens and glare

There have been a surprising number of occurrences due to a degraded windscreen including a dirty one.

The position and angle of the sun, and its associated glare, is a particular hazard for helicopters operating around wires.

Before any job involving flying near wires, the pilot should think about where the sun will be coming from and the possibility of glare hiding the presence of wires.

But sun glare can degrade vision in many other ways, including affecting a pilot’s judgement of height on final approach, difficulty in spotting other traffic, and making instruments, especially screens, impossible to read.

The problem is made far worse because of a simple, dirty windscreen.

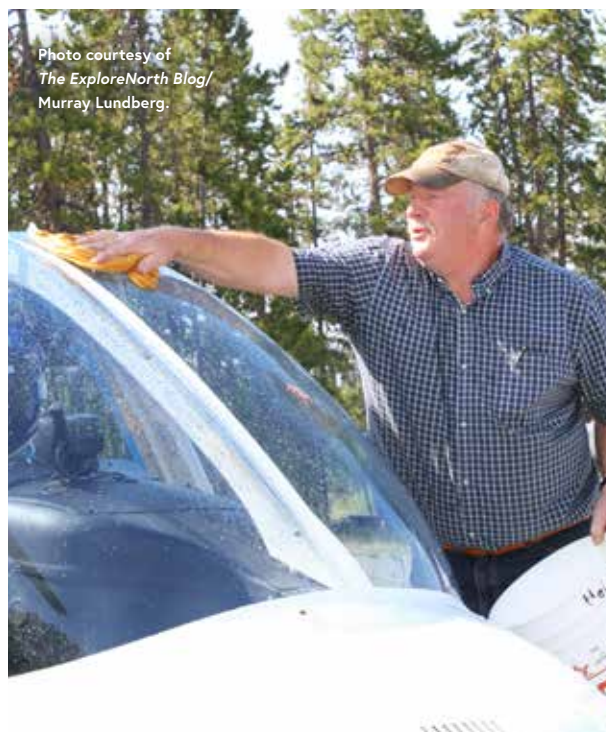


Photo courtesy of
The ExploreNorth Blog/
Murray Lundberg.

// Always carry clean fresh water and clean rags to wash the bubble. You won’t always be parked up near cleaning materials.

Riaan Botha has the following concrete advice:

“One of the ways to avoid windscreen damage, is to simply keep it clean. We’re flying in salty conditions most days and the build-up of salt can have quite an effect.

“That can be made even more dangerous if sun glare hits the salty windscreen. So we carry clean fresh water in all our aircraft and some clean rags, because you’re not always parked up where there are cleaning materials. Just give the bubble a bit of a rinse and wipe.”

It’s important to wipe up and down, rather than across or in circles, so any small scratches don’t exacerbate the effects of sun strike.

“Lots of helicopters sit in the sun for quite long periods. And as we know, the sun is pretty brutal in New Zealand,” says Riaan.

“Over time the ultraviolet light can have a chemical effect on the windscreen and haze it up.

“The answer is very simple. Keep the machine in a hangar as much as possible.”

Finally...

To get an idea of what can happen in inadvertent IMC, go to YouTube and search on “CASA 178 seconds to live”. 📺



FLIGHT TRAINING LESSONS AFTER LOCKDOWN

After a seven week-long Covid-19 enforced grounding, flight training schools had to consider how they would return to flying under Alert Level 2. And it wasn't just a case of opening their doors and letting the students flood back in.



Ian Calvert is the CEO of Ardmore Flying School in Auckland, which has a large contingent of foreign students.

He says they did as much preparation as they could so the school was ready for the students to come back at level 2.

“We were very mindful of the fact that they hadn't flown for a while. It depended where they were at in their training as to what we required, but for the more junior students or international students we made sure they did a dual instruction flight before they went off solo,” Ian says.

He says they got New Zealand Qualifications Authority (NZQA) approval to deliver some courses online during Alert Levels 4 and 3, which are normally done in the classroom. That way students were able to carry on with some subjects, like instrument rating.

Ian says the rules in place under level 2 changed the nature of the operation somewhat.

“We had fewer people in the building, they came in and flew, then went home again. We had some small classes running that complied with the social distancing rules. Anybody who came into the building had their

temperature taken and signed in and out to allow for contact tracing.”

Massey University School of Aviation in Palmerston North is a large flying school.

CFI Paul Kearney says when level 2 arrived, they did a phased start up, getting the staff ready first.

“Technically everybody was current but we applied the safety brush across that. So first we got the staff flying and got everybody current – three take-offs and landings in the aircraft and using the simulator for IFR guys,” Paul says.

“Once we got that all sorted as well as making sure the aircraft were all running smoothly again, the students started coming back, which was at least a week after level 2 came into force.

“And we basically said every student had to do a dual lesson first so we’re not letting a student go out on their own who hasn’t flown for 60 days.”

He says it’s important they take an individualised approach for each student.

“For example, those who are close to flight test – we need to do a bit more flying with them, not just the syllabus that’s published. We need to make sure we’re actually catering to each student because they’ve all got different needs, it’s been quite a stressful time for them as well.”

Paul says just being patient will be key.

“And any signs of any sickness – we’ve got to be a lot more tolerant in this new world with that kind of stuff. When a student has a runny nose we’ve actually got to keep them away from the centre until we can be sure they are okay, so it will be interesting times for the next little while.”

Greg Hagarty, the CFI at L3Harris Airline Academy, says they ran a series of Zoom sessions to help students

prepare for a return to flying, which meant a smooth resumption of flight operations.

“The students embraced the chance to refresh their knowledge and the Q and A sessions were full on,” Greg says.

The flight training school has a large foreign student population and they stayed in one big bubble in student accommodation near the school.

“Our students were instrumental in developing and implementing Covid-19 procedures in their accommodation, their input was vital to the effectiveness of level 4 procedures.”

Greg says re-starting flight operations was only possible after extensive risk analysis with their Covid Operating Procedures. The emphasis was put on student and instructor currency, and aircraft engineering.

“Each of the students were assessed individually and we developed a programme of additional flying for each one of them to allow a smooth progression of their training.

“The week before flight ops began, a team of instructors carried out checks as recommended by our maintenance company to ensure all aircraft were fully airworthy. In addition, the first flight post lockdown commenced with two circuits as an added safety measure.

“Our instructors were well within currency, having said that the Standards Team have been full on doing standards checks and renewals with them with special focus on the newer C-cats.”

Southern Wings flight training school in Invercargill caters to mostly domestic students.

Its CEO Bryan Jones says they were conscious of the fact that the students hadn’t been in the air for several weeks.

“So when we got back into flying operations, all students irrespective of where they were at had to have a dual check. The students are all at different levels, some getting close to completion, and some just kicking off but it was just as easy to make everyone do dual check initially,” says Bryan.

“They were all still within their currency requirements but we just sort of slowly eased them back into it rather than roaring into it.”

Greg Hagarty says the last couple of months have also highlighted the benefit of maintaining digital records.

“To be able to quickly access everybody’s expiry dates and know exactly who needed to take advantage of the CAA extensions that applied, proved very useful for us.” ➤

//The students embraced the chance to refresh their knowledge and the Q and A sessions were full on... //

BIRD STRIKE!

Experienced pilot Phil Welcome got the fright of his life when he took off in his Piper PA-31 Navajo from Whitianga aerodrome in March and met with a “river of brown”.

// The damage to Phil Welcome's Piper PA-31 was extensive, the strike to the left tail was the most dramatic. Photo supplied by Phil Welcome.

An aviation examiner with approximately 40 years flying under his belt, Phil Welcome's seen a few things in his time.

His Navajo had been parked at Whitianga and he wanted to position it back to Ardmore.

“On the day it was a light easterly which favours runway 04 at Whitianga,” says Phil.

It was late morning; there was nothing about the day or the conditions that could have given warning to what Phil was about to experience.

“At about the lift-off point I met a river of brown which collided with me just after rotation. A flock of Canada geese was airborne and came out of the cross runway from my left.

“I hit between 15 and 20 birds. They made a lot of noise and the aircraft lost a lot of power.”

The damage to his Navajo was extensive. There were three main impacts to the nose area.

“A bird hit the nose leg. Both the landing and taxi light were broken. Another bird hit some of the aerals underneath. One bird went into the engine on the left hand side. On one side the de-ice boot on the wing leading edge was hit and the bird broke off a vortex generator as it went over the top, which I found on the runway. It was not far from the paint and gel-coat shrapnel on the ground. The other wing had a similar strike and there was a gouge through the paint into bare metal but the bird had gone between the vortex generators.”

Phil says each side of the tailplane suffered a tremendous impact and the tailplane leading edge was destroyed.

After the bird strike, Phil was able to land and taxi back to the apron area to clear the runway.

Still catching his breath from the shock, Phil then had to start the grim process of cleaning up his twin-engine aircraft.

“I began to remove bird parts from the engine cowling and undercarriage legs. The look and smell was awful. Bits of dead bird were getting baked onto some of the cylinder fins and I was concerned about engine cooling. Shortly after, a friend came down with a hose and a power washer to help clean the aircraft.”

About then some other club members came over to help and someone suggested that Phil take photographs before too much cleaning, to document what had happened.

“It took nearly two hours to remove the blood and guts from the aircraft. Not all the damage was noticed until after the washing.”

Phil says an examination of the runway counted 13 birds, and a pile of debris looked big enough to account for at least three more.

“While some of the birds went over the top, causing the big dents, I think a number went underneath and through the propeller arc. The engines lost about 500 RPM as we ploughed through the flock. Both props had blades bent out of track.”

Phil says he was very lucky that none tried to come through the front windscreen, and blood on the fuselage shows at least one came close.

Peter Stevenson-Wright has been in the CAA's Safety Investigation Unit for 23 years and has seen his share

of occurrences in that time, but says the sheer number of birds that Phil struck was very unusual.

“This bird strike is the only one I recall where so many birds, and large birds at that, were killed at one time. It was also fortunate that the pilot was able to land immediately and avoid having an accident.”

Phil says what saved him was the preflight take-off drills.

“Crucially I back-tracked for full length and configured flaps for soft surface take-off. Personal brief: ‘unless we get 100 knots (blue line) gear up we are not attempting to go’. The royal ‘we’ is the aircraft and myself,” Phil says.

He says when the problem came, no piloting skill was required.

“It became simply: close the throttles, keep straight, hold the attitude. The aeroplane settled back on the ground.”

Phil also can’t emphasise enough the importance of making notes at the time of the incident.

“I was fortunate to have one passenger on board – a friend who’s a C185 pilot. He was able to fill in some details after the incident.

“I recall during the strike the hardest part was keeping eyes on the horizon and keeping the aircraft straight. A lot of brown birds flashed past the windscreen.”

Mixing it in the skies

Be aware of the heightened risk of bird strike at this time, with the big drop-off in aircraft activity, as a result of the COVID-19 restrictions.

More birds will have settled in and around aerodromes, particularly near the coast.

So be extra careful.

What happened to Phil could happen to any pilot and in most cases the pilot has little advance warning of the danger.

Bird strikes tend to happen below 800 feet during the take-off and landing phases.

Higher speeds have also led to greater impact forces and more serious consequences. In a collision, doubling the mass of the bird doubles the energy of the impact.


And the Canada geese that Phil encountered aren’t small. Their length can range from 85–95 cm and they typically weigh between 4.5–5.5 kg.

The best way to make an aircraft conspicuous to birds is to turn on all its lights. Landing lights and strobes should be on when operating on or near any aerodrome.

Pilots who regularly fly below 500 feet AGL for bona fide reasons can help protect themselves by becoming familiar with, and avoiding, bird nesting or feeding grounds and high-tide roosting areas. Avoid flying along the coast, harbour mouths, dune banks or other wetlands. Or remain at least 1000 feet above them, to minimise the disturbance to birds.

If weather conditions dictate that you do have to fly along the coastline at low level (ie, down to 500 feet AGL), maintain a good lookout, and be prepared to take avoiding action.

You must report all bird hazards, near misses and strikes. Without such information, there’s no firm evidence to justify bird-control measures.

For more information, email publications@caa.govt.nz for a free copy of the Good Aviation Practice booklet, Bird Hazards. 



// The left engine took a bruising. Photo supplied by Phil Welcome.

ADVICE FROM ADS-B EQUIPPED PILOTS

The government's ADS-B grant scheme has received more than 500 applications. Three pilots told *Vector* about the difference the technology has made to their flying, and what to watch out for.

South Island pilots Ian Andrews and Ian Sinclair say their ADS-B technology came into its own on a recent AOPA safari around the top of the island.

"At no stage did I not know where the other two in my group were," says Ian Andrews.

"Even flying down the remote Clarence River valley to Quail Flat, we all knew where each other was.

"When we came out of the Clarence onto the coast, heading back to Kaikōura, there was a lot of traffic going in all directions. In most cases the ADS-B IN told us where to look long before we saw the aircraft."

"Many of the places we flew," says Ian Sinclair, "weren't covered by cell data networks so 'in app traffic sharing' services, like in OzRunway, didn't work.

"But ADS-B IN relies only on other aircraft having ADS-B OUT. It works everywhere."

Increasing uptake = increasing safety

Ian Sinclair says he got the technology because he wanted to play his part in safety and be electronically conspicuous to others.

"I enter controlled airspace fewer than 10 times a year, but I want the choice to do so. My flights quite often take me into transponder mandatory zones however."

He says the growing take-up of the new tech will obviously add to safety.

"When the Rangitata River bridges were out (due to flooding in December 2019) it was interesting to fly in that area with about half of the aircraft transmitting with ADS-B OUT.

"I regularly fly into Wanaka where there are a good number of aircraft equipped with ADS-B OUT. I've had several traffic alerts in the circuit. All have been for traffic that I'd already viewed out the window, but it's reassuring to see the system working as it should."

// Modern ADS-B technology fitting nicely into a simple Cessna 172 cockpit.



Great traffic information

Ian Andrews says the technology gives him traffic information almost equal to what a passenger aircraft pilot would receive.

“My PA28-236 has a Garmin glass cockpit, ADS-B OUT via a Trig TT31, and ADS-B IN using a Garmin GTS 800 traffic awareness unit. This is more than just ADS-B, although I think ADS-B is the best part of the system.

“With the G500 screen right in front of me, the direction of traffic and height difference between aircraft is clearly shown on the MFD page.”

Avoiding a near miss

Steven Perreau of North Shore describes how ADS-B helped him avoid a possible near miss.

“I was coming back from Whangārei and flew out to the coast. I noticed a target on the screen and I could tell it was a ground target because it was displaying as a brown diamond. That told me it wasn’t moving.

“I’m going, ‘what the heck? There’s no airfield out here. That’s really odd’.

“So I climbed to about 900 feet and moved further out to sea for a good look. And I saw some sort of resort with a helicopter on the ground, deep in trees, with its rotors turning. It was clear they’d started up and were about to take off.

“It wasn’t necessarily a ‘save’, but it’s possible the helicopter could have taken off from inside that group of trees, and I could have been in its path.”

Steven says even TCAS or ACAS wouldn’t have been able to warn him of that helicopter “because it’s unlikely it would have been on mode C. It would have been on Standby and transmitting nothing”.

“With the old tech, you just don’t get the sort of situational awareness that I got that day as the miles were ticking down.”

The audible assistant

All three pilots value the audible traffic alerts the technology provides. In fact Ian Sinclair feels they’re of even more value than the display.

“I really appreciate an ‘assistant’ who’s calling out traffic,” he says. “It adds to what I can see out the window, and hear on the radio, in building my situational awareness.

“On one occasion, I came over a ridge north of Masterton and received an audible warning ‘1.6 miles three o’clock low’. A Fletcher was landing on a fert strip on the other side of the ridge.”



// Aspen showing live ADS-B in traffic displayed in ARC mode in flight.

“Once, leaving Nelson,” says Ian Andrews, “there was an inbound Sounds Air plane passing overhead 1000 feet above me. I did see it out the window, but, should I have not done so, the audio sounding, ‘Traffic! Traffic! Traffic! One o’clock closing!’ would really have got my attention...”

Ian says the screen also did its bit to warn him of traffic in close proximity, flashing from black to yellow.

Steven Perreau tells a story of how the combo of display and audible alert warned him of hard-to-detect traffic.

“I was tracking towards Orere Point and another aircraft appeared on the screen. It was flying right to left at four to five o’clock, and the ADS-B told me it was about 200 feet below me.

“And then the audible traffic alert encouraged me to climb a little further, for more separation and to visually pick up the other aircraft.

“I’m a low wing. I would normally never have seen it. And – they were possibly making radio calls on another frequency – I never once heard a radio call from them.” »

// Lookout, good radio work, and predictable flight patterns all need to be maintained. //

» 'Enhancing' comms with Airways

Ian Andrews says ADS-B OUT also helped – sort of – when he was flying to Omaka from Nelson via the Wairau River.

“I had this great idea to do a Domes arrival from the west by using the transit lane below 1500 feet, to avoid talking to the Tower at Woodbourne.

“Before reaching the control zone I descended to 1400 feet AMSL. Anyone who knows that area will know you cannot stay at that height and cross the hills unless you're about 50 feet AGL. Naturally I didn't want that, so thought I'd sneak around the corner of the control zone.

“‘Nekminit’ I got a call from the Tower.

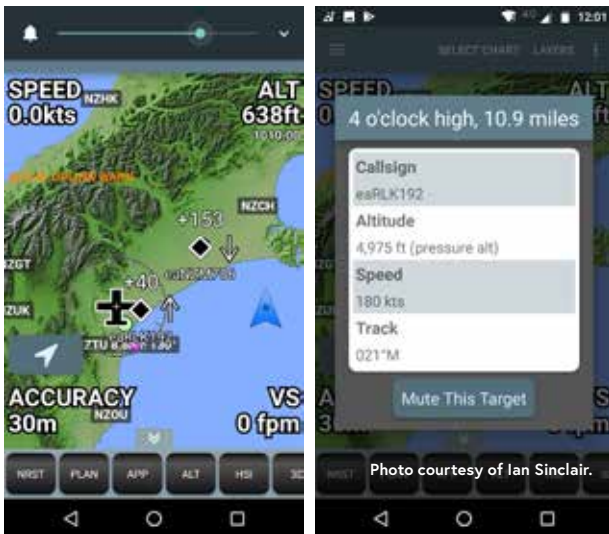
‘Foxtrot Mike Sierra, Woodbourne Tower’. He knew where I was and who I was.

“I responded with, ‘I know, I know. I'm just turning right to the Domes, sorry’.

“A mike click response let me know we understood each other.

“Was that a benefit or not? I think it was. It shows surveillance really works.

“Better to be spoken to early than face the consequences when you get too far into an area you shouldn't be in.”



// Moving map showing ADS-B target.



// Transponder and moving map.

Lessons

Steven Perreau says with ADS-B, the transponder should always be started up, not in Standby or Off, but in ALT mode.

“In ALT mode, the transponder knows you're on the ground, and it begins transmitting at a reduced rate, every few seconds, reporting you're on the ground.

“The transponder automatically switches from ground to airborne mode, and back again.

“Modern transponders, like the Garmin GTX 345 that we have in our aircraft, should always be started up in ALT mode, and when you land you don't touch it.

“You don't ever select Standby mode. The only reason you'd ever select Standby is if air traffic control told you, you were transmitting faulty data, because Standby would stop that transmission.

“But in Standby mode, the Garmin 345 still continues to receive traffic around you, using ADS-B IN.”

Ian Sinclair encourages other pilots to learn the new technology while still on the ground.

“You need to rate yourself on the new equipment and incorporate ADS-B operations into your procedures – before you fly.”

For Steven Perreau, ‘ground work’ means understanding what the display symbols represent.

“I read my manual backwards and forwards and learned all the symbols. If you understand what all the colours and shapes mean before you fly, you won’t be going, ‘What the heck is that showing?’ and getting all tied up looking at the display, instead of outside the cockpit.”

No replacement for the Mark 1 Eyeball

Steven says it’s important pilots new to ADS-B get to know their technology well.

“One day I got into our aircraft, and one of the guys in our syndicate had accidentally selected ‘traffic none’ so there’d be no traffic displayed. The Apsen glass cockpit can be set to a number of modes for traffic display ranging from *none*, *above*, *below*, *normal*, and *unrestricted* to give you the best traffic picture you want. I guess they set it to ‘none’ by mistake.

“So you can never assume that a lack of traffic on the display means there’s actually no traffic around.

“There can be a multitude of reasons why a target doesn’t appear. The other aircraft doesn’t have ADS-B, or it’s faulty, or it’s in Standby mode, or in ‘traffic none’ mode.

“You’d be a mug to use it 100 percent instead of the Mark 1 Eyeball.”

Ian Sinclair agrees. “You cannot be tricked into assuming all traffic is electronically visible. It’s not. Even though it has quite good eyesight, ADS-B IN is still only one tool in the awareness shed.

“Lookout, good radio work, and predictable flight patterns all need to be maintained.”

Avoid bedazzlement

Both Ian Sinclair and Steven Perreau warn against becoming intoxicated by the new tech.

“It can be very demanding of your attention,” says Ian. “You need to not be all-consumed by it.”

Steven Perreau agrees. “Every shiny new toy in the cockpit has the possibility to distract the living heck out of a pilot. If you’re VFR, you have to always be looking outside.”

Ian Sinclair says the basics do not change with ADS-B.

“It’s aviate, navigate, communicate – then technology.”

To keep up-to-date

To get the latest information on ADS-B and to apply for a grant, visit www.nss.govt.nz/adsb. ➔

NEW AND UPDATED PRODUCTS

A new addition to the range of CAA’s Good Aviation Practice (GAP) booklets is the guide to managing a safety management system.



How to be a safety manager NEW

This new booklet includes advice on the personal and professional qualities needed to be an effective safety manager. It also includes brief guidance about the role from current safety managers.



Helicopter performance UPDATED

A significant number of New Zealand helicopter accidents are performance-related. This updated booklet outlines the latest advice on factors affecting performance. It guides pilots in making sure a proposed operation can be safely accomplished.



In, out and around Christchurch UPDATED

Canterbury is a busy and complex piece of airspace. This refreshed booklet brings pilots up-to-date with airspace requirements, and visual reporting points.



How to report occurrences UPDATED

The CAA has to be told if certain work-related events happen while an aircraft is ‘in operation’. This booklet brings you up-to-date on the information you need to know as an aviation participant.

These, and our other GAP booklets, are available on the CAA website, aviation.govt.nz > Safety > Good Aviation Practice booklets.

Or you can order free printed copies by emailing publications@caa.govt.nz

A MESSAGE TO AIRCRAFT OWNERS

This is about maintenance. As your aircraft retakes the skies after the COVID-19 grounding, it's crucial to understand your obligations.

If you're an aircraft owner, the onus of your aircraft's airworthiness is on you. Not your engineer.

Yes, only those people referred to in rule 43.51 can perform maintenance and certify a release-to-service after aircraft maintenance carried out in accordance with 43.101. But you're effectively the maintenance controller of your aircraft.

So, apart from a passing familiarity with what's going on under the cowl, you need to follow up with your maintainer any airworthiness directives and other instructions for continuing airworthiness. Don't wait for them to follow up with you – that's not their responsibility.

Make sure your aircraft has its required inspections – for example, operational check flights and duplicate inspections – done correctly, and that it's been properly released to service after maintenance.

Keeping records up-to-date is your responsibility

As the aircraft owner, it's you who's required to keep and maintain your aircraft's maintenance records.

You could arrange or contract for an engineer or maintenance organisation to maintain those records, but it remains your responsibility to see they're completed accurately and on time.

Some documents need to be carried in the aircraft, such as the certificate of airworthiness, and some must not, eg, aircraft logbooks. The requirements will vary for some non-standard category aircraft. See the relevant rules, for instance, Part 106 for hang gliders. For more information on the maintenance responsibilities of an aircraft operator, read rule 91.603 *General maintenance requirements*. Visit aviation.govt.nz > Rules.

Remember that paperwork is king, and the value of your aeroplane is also in its records. So keep them tidy, safe, and up-to-date. It makes good sense because your aircraft, apart from anything else, is your investment.

To read more about your obligations as an aircraft owner, email publications@caa.govt.nz, for a free copy of the Good Aviation Practice booklet, *How to be an aircraft owner*.

Will you own an aircraft on 1 July 2020?

The annual registration fee and participation levy are invoiced on 1 July to the participant who is the registered aircraft owner on that day. The registered owner must pay the fee and levy regardless of the state of the airworthiness, or pending sale, of the aircraft.

The Civil Aviation Act 1990 defines 'owner' as the person lawfully entitled to possession of the aircraft for 28 days or longer. This means if you lease the aircraft for 28 days or longer, you are deemed to be the owner.

If you're selling an aircraft before 1 July, a change of possession form must be received and actioned by the CAA before 1 July 2020 so you should send this in as early as possible to allow time for processing. If the aircraft is still in your name on 1 July, you're liable for the invoice, even if you've sold the aircraft.

Once the CAA has issued you with the invoice, you can't transfer it to anyone else. Payment is due by 20 July 2020. If it isn't paid, the aircraft may be deregistered but the fee and levy will still be collectable. If the aircraft is deregistered, its airworthiness certificate, or flight permit, is revoked and the aircraft cannot be legally flown.

If you have any queries about the fee and levy, email: aircraftregistrar@caa.govt.nz.

// Other reminders

Please remember to tell us if your details change, especially your email address. Visit: aviation.govt.nz > Contact us > Change of address.

Make sure your ELT beacon is registered with www.beacons.org.nz and the information is up-to-date.

If you subscribe to aeronautical publications, remember to notify Airways, visit: shop.aeropath.aero. 📧

Unite against COVID-19

VECTOR AND COVID-19

This edition of *Vector* arrives a little later than planned and we apologise for that. Our resources were used for providing updates about COVID-19 on the CAA website and a couple of 'Vector online' articles about getting back in the air.

CORRECTIONS

"Taking drone safety seriously" – Autumn 2020

Mick Turner is the Director of Cratos Limited and has provided guidance on safety to Jack Scott of NZ Drones. He was not hired by Jack to be NZ Drones' safety manager.

"With aerodrome safety, size doesn't matter" – Autumn 2020

We gave a wrong frequency in this article and apologise for this. To clarify, Rangiora CFZ is 120.2 MHz and Canterbury CFZ is 119.2 MHz, the same as Forest Field aerodrome.

AVIATION SAFETY ADVISORS

Contact our aviation safety advisors for information and advice. They regularly travel around the country to keep in touch with the aviation community.

John Keyzer – Maintenance, North Island
027 213 0507 / john.keyzer@caa.govt.nz

Carlton Campbell – South Island
027 242 9673 / carlton.campbell@caa.govt.nz

Neil Comyns – Maintenance, South Island
027 285 2022 / neil.comyns@caa.govt.nz

HOW TO GET AVIATION PUBLICATIONS

AIP New Zealand

AIP New Zealand is available free from www.aip.net.nz. Printed copies of Vols 1 to 4 and all aeronautical charts can be purchased from Aeropath on 0800 500 045, or shop.aeropath.aero.

Pilot and aircraft logbooks

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

Rules, advisory circulars, airworthiness directives

These are available free from the CAA website. 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 aero@caa.govt.nz.

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

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

For more info, visit aviation.govt.nz > Safety > Airshows.

CAA cut-off date	Aeropath cut-off date	Effective date
03 Jun 2020	10 Jun 2020	13 Aug 2020
01 Jul 2020	08 Jul 2020	10 Sep 2020
29 Jul 2020	05 Aug 2020	08 Oct 2020
26 Aug 2020	02 Sep 2020	05 Nov 2020

Visit aviation.govt.nz/aip to view the AIP cut-off dates for 2020.

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)
aviation.govt.nz/report

The Civil Aviation Act 1990 requires notification "as soon as practicable".

ACCIDENT BRIEFS

Robinson R44 II

Date and time:	14-Mar-2015 at 17:20
Location:	French Pass
POB:	1
Injuries:	1 fatal
Damage:	Destroyed
Nature of flight:	Private other
Pilot licence:	Private pilot licence (H)
Age:	66 yrs
Flying hours (total):	810

The helicopter pilot was conducting a private flight in the vicinity of D'Urville Island. Witnesses observed the helicopter flying low in a north-easterly direction toward French Pass, and climbing to the ridgeline below the D'Urville Island overhead power line crossing. The helicopter was then seen to be in a steep dive, followed by it striking the surface of the sea in a nose-down attitude.

It's most likely that the pilot suffered a lapse in memory concerning the power lines, resulting in a wire strike occurring when they climbed to overfly the ridgeline.

This accident highlights the need for pilots to be aware of and comply with the minimum altitudes for VFR flight, as prescribed in Civil Aviation Rules, Part 91 *General Operating and Flight Rules*. This is to provide a margin of safety to prevent collisions with obstacles or hazards, knowing that loss of awareness of obstacles and hazards can occur. Pilots also need to be familiar and pre-briefed regarding obstacles and hazards on the route that they plan to fly.

A full report is on the CAA website.

[CAA Occurrence Ref 15/1102](#)

Piper PA-38-112

Date and time:	23-Mar-2014 at 11:52
Location:	Hastings
POB:	2
Injuries:	2 fatal
Damage:	Destroyed
Nature of flight:	Training dual

During a dual training flight in a low flying zone, the aircraft departed controlled flight and subsequently impacted the terrain.

The departure from controlled flight most likely occurred when the aircraft's critical angle of attack was exceeded, resulting in an aerodynamic stall and spin entry. From the

More accident briefs can be seen on the CAA website, aviation.govt.nz, Safety > Aircraft accident briefs. Some accidents are investigated by the Transport Accident Investigation Commission, www.taic.org.nz.

height the aircraft was estimated to be operating at, it would not have been possible for either pilot to recover the aircraft from the stall.

The safety investigation could not conclusively determine why the aircraft reached a point where the departure from controlled flight had occurred. Two likely scenarios include incapacitation of one of the pilots, or a handling error.

Four safety observations were raised and addressed as a result of this accident.

A full report is on the CAA website.

[CAA Occurrence Ref 14/1194](#)

Aerospatiale SA 315B

Date and time:	25-Oct-2018 at 11:00
Location:	Kaiangaroa Forest
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Agricultural
Pilot licence:	Commercial pilot licence (H)
Age:	45 yrs
Flying hours (total):	7235
Flying hours (on type):	425
Last 90 days:	170

During a forest spraying operation, at approximately 40 feet when taking the weight, there was a loud bang from the engine. This was immediately followed by a loss of power. The pilot used the remaining rotor energy to reduce the rate of descent, but landed heavily. The helicopter remained in an upright position.

Maintenance investigation found that the forward coupling sleeve Pt No 0218997020 and its stub shaft Pt No 0218150020 in the engine drive train failed. As a result, the main rotor transmission became disconnected from the engine, forcing the pilot to conduct an autorotation.

The total time in service of the coupling sleeve and stub shaft couldn't be determined as the components are not lifed and condition is assessed at engine overhaul. The engine was operating on-condition at the time of the failure.

[CAA Occurrence Ref 18/7515](#)

GA DEFECTS

KEY TO ABBREVIATIONS:

AD = Airworthiness directive **NDT** = non-destructive testing
TIS = time in service **TSI** = time since installation

P/N = part number **SB** = Service bulletin
TSO = time since overhaul **TTIS** = total time in service

Cessna 208B

Engine control

Part model:	TPE331-12JR-702TT
Part manufacturer:	Honeywell
Part number:	3108250-2
TSI hours:	32.4
TTIS hours:	7320.3

During descent, after dropping skydivers, the engine started surging with fluctuations in EGT and torque while throttle was set low. The pilot elected to keep the engine running as he determined this to be a computer-related issue and that the engine was not going to deteriorate below the idle setting.

A PAN call was made to the Tower as a precaution. Passing 8000 ft the pilot realised they had no power available and elected to carry out a forced landing onto the aerodrome which was carried out safely. Once on the ground, the engine was still surging with fluctuating EGT and torque. Sufficient power was available to taxi clear of the runway before shutting down.

The maintenance investigation involved extensive testing of the engine and associated systems. No fault could be found which would cause the reported symptoms. In consultation with Honeywell, the aircraft was put back into service. There have been no further issues with the engine.

[CAA Occurrence Ref 19/153](#)

Eurocopter AS 350 BA

Engine support bracket

ATA chapter:	7120
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During periodic maintenance, the engine shock mounts required replacement due to excessive distortion. The aircraft had approximately 1280 hours logged since the engine was last installed.

The engineering investigation identified that this was caused by the lugs coupling the shock mounts to the engine being installed with the slots facing aft. The lugs were removed and installed in accordance with the manufacturer's specifications.

The shock mounts were replaced and the engine installed. No offset pressure was observed on the shock mounts, and driveshaft balance was verified.

[CAA Occurrence Ref 16/6869](#)

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 website, aviation.govt.nz, Aircraft > GA defect reports.

Pacific Aerospace Cresco 08-600

Elevator

ATA chapter:	2731
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The aircraft was approximately 50 ft on approach to land when the elevator appeared to jam. The pilot was able to use power and trim adjustments to make a safe landing.

An on-site engineering investigation found that the elevator bell crank pushrod boot had migrated along the pushrod and effectively reversed itself, jamming the elevator.

The boot had been replaced one year earlier and only visually inspected since. It could not be determined when or why the boot slipped out of position, but the observed condition of the hose clip used was suspected to be a causal indicator.

The operator will review the frequency of their maintenance procedures and hose clip replacement timetable, review the type of hose clip used or maybe even use two clips, and add cleaning and conditioning of the leather boot to the inspections programme, in order to keep it soft.

[CAA Occurrence Ref 17/7977](#)

Piper PA-38-112

Carburettor

Part manufacturer:	Marvel Schebler
Part number:	10-5199

The aircraft conducted a forced landing into a paddock due to engine power loss. There were no injuries or damage. The investigation identified a seed pod in the carb bowl which likely restricted the main fuel jet.

The operator and maintenance provider carried out further technical investigation. This revealed that unfiltered air was leaking through previously unseen holes in the carb heat box when carb heat was applied. This resulted in cold air being ingested along with the hot air (effectively a partial application of carb heat, which unintentionally provided an entry point for foreign matter to enter the hot box and in this case into the fuel bowl via the vent hole). The holes in the carb heat box were sealed.

[CAA Occurrence Ref 18/2920](#)

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For owners and operators, increase your understanding of the requirements for maintaining your aircraft.



- **Taupo**
04–05 August 2020
Suncourt Hotel & Conference Centre
- **Auckland**
22–23 September 2020
Sudima Auckland Airport

Register your interest to attend a South Island AMW in late 2020. Email education@caa.govt.nz.

AVIATION SAFETY FUNDAMENTALS WORKSHOP

Two days, \$375 including GST, per person.

Previously known as the Aviation Safety Officer course, this workshop is designed to teach you about the principles of aviation safety, and the importance of having an aviation safety programme.



- **Auckland**
14–15 September 2020
Sudima Auckland Airport
- **Queenstown**
09–10 November 2020
Copthorne Queenstown Lakefront
- **Christchurch**
20–21 July 2020
Sudima Christchurch Airport

UPDATED

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- **Auckland**
16–17 September 2020
Sudima Auckland Airport
- **Queenstown**
11–12 November 2020
Copthorne Queenstown Lakefront
- **Christchurch**
22–23 July 2020
Sudima Christchurch Airport

NEW

OCCURRENCE INVESTIGATION WORKSHOP

One day, \$195 including GST, per person.

This workshop is designed to give you the knowledge and skills to investigate an occurrence.



- **Auckland**
18 September 2020
Sudima Auckland Airport
- **Queenstown**
13 November 2020
Copthorne Queenstown Lakefront
- **Christchurch**
24 July 2020
Sudima Christchurch Airport

NEW

For more information, and to register, visit aviation.govt.nz > Safety > Education and events



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