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SPRING 2022

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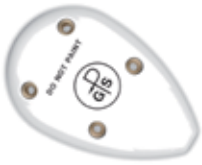

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TRIG

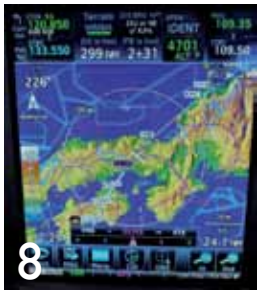
APPROACH: *SPRING 2022*
ISSN 2422-8230 / 2538-1083 (*Online*)

Coming up

- *Charle Draper's Fly-in Darfield, 7–9 October*
- *South Island Akro Fest Ashburton, 3 December*
- *AOPA AGM 2023 Whitianga, 4 March*
- *AOPA Northern Safari 5–11 March 2023*
- *Watch your inbox for notification of One-Day Fly-ins*

For more visit www.aopa.nz

Cover photo: Midwinter Fly-in, Haast, drop in at Gorge River.
Photo credit: John Evans



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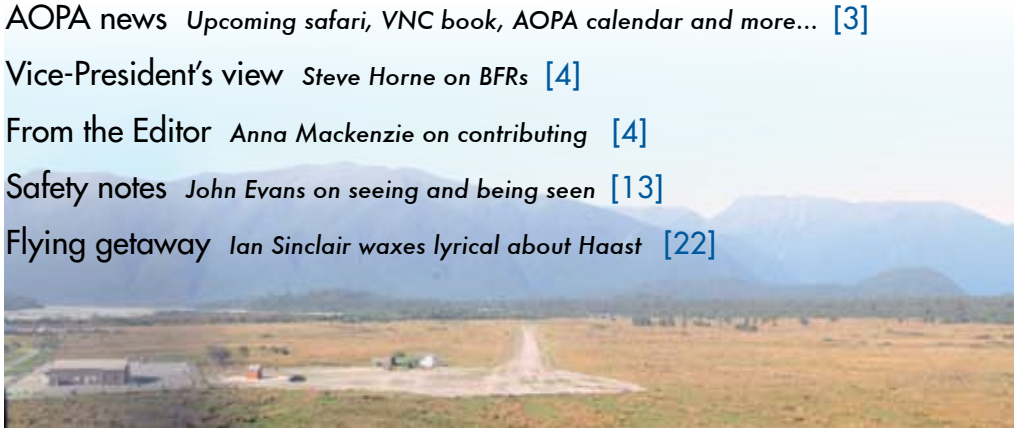

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Deadline for ads, articles and photos for the next (Summer) issue: **20 October 2022**.

President's Comment

I've clocked up 46 hours in MSR and it is still teaching me ways to behave in an aircraft! I love it. Owning an aircraft and mixing with like-minded aircraft owners and pilots within our collegial AOPA NZ ensures I remain up-to-date with the General Aviation industry – particularly important as President of AOPA NZ!

The highlights this quarter include:

A meeting with Keith Manch, Dave Harrison, Mike Hill and John Kay of CAA. Topics discussed included CAA target communication, CAA staff mentorship, CFZ and other aerodrome matters. All issues were well canvassed and discussion well received. I anticipate being able to share outcomes in due course.

Participating in the Aviation Federation. This invaluable group provides a forum for discussion across all sectors of the GA industry, allowing the sharing of concerns and frustrations as well as successes. A current topic is compliance and post-lockdown progress on various issues.

IAOPA. AOPA NZ falls into the Pacific Region of IAOPA, and reports, support and general communications come via Andrew Anderson of Australia, IAOPA Vice President of the Pacific Region. Issues of note currently include the environmental implications of leaded fuel, carbon footprint, lack of staffing within industry and government due to ongoing illness in this post-lockdown era, dependency on agencies to meet compliance and, of course, global warming. There is a plethora of reading on the internet about these issues, all of which present challenges to maintaining our ongoing freedom to fly. I welcome the opportunity IAOPA gives us to engage with internationally regarding the future of our aviation industry.

Our safety team within the AOPA NZ Executive Committee has now completed the ERP, providing templates for members who attend our fly-ins. This enables mitigation of risks associated with numbers of aircraft attending any given destination.

The weekly update emails from AOPA NZ continue to be well received. If you have not received emails with this title, please search it out in your inbox or check your spam folder. Alternatively let your Executive Committee know if you need assistance.

The Executive is also engaged in creating a Charitable Trust for AOPA NZ. This is a win-win for our Association, and we look forward to presenting it to our AGM in Whitianga in March 2023.

Airshows are slowly returning, and AOPANZ plans to attend the Wings Over Wairarapa Air Festival in February 2023. Come along and say hello!

Finally our AOPANZ name badge is getting a revamp and we are excited to share the design with you all… watch this space.

Sue Kronfeld, President

A warm welcome to new members:

Grant Stewart, Mt Pisa; John Ashmore, Brightwater; Rob Kofoed, Otaki; Angela Ford-Kofoed; Tony Delaney, Twizel; Libby Melhopt, Oamaru; Bruce Sutherland, Hastings; Brian Pilcher, Paraparaumu; Lachie McKenzie, Kurow; Nick Dee, Auckland; Nigel Dee; Jason Boyle, Mount Maunganui; Luke Venables, New Plymouth; Ted Grenfell, Dunedin; Michael Mckeon, Wellington; Lucy Newell, Masterton; Bevan Dewes; Andrew Dunstan, Tauranga; Mark Scapens, Mount Maunganui; Scott Jeanes, Hamilton; David Sale, Kaiapoi; Bob Colman, Hamilton; Chui Ping, Cheung; Chris Sangster, Cromwell; Roger Simpson, Cromwell; Mark Williams, Tauranga; Bianca Barbarich-Bacher, Auckland; Colin Mckenzie, Blenheim; Jane Mckenzie; Bill Kendall, Taupo; Mary Legg; John Harwood, Waikanae; Jacqui Mills; Richard Black, Dunedin; Chris Skippen, Upper Moutere; Kath Middleton; Peter Finnegan, Twizel; Enrico Smania, Italy.

AOPA News

Up-dates aplenty in new VNC Chart book

Production of this year's AOPA NZ VNC book is well underway, including significant changes to Auckland and Wellington control zones. New visual reporting points and danger zones also contribute to making this an essential cockpit back-up tool.

The effective date for all charts is 1 December 2022, and we are expecting an on-sale date around mid-November.

Photo opportunity

It's time to submit your entries for the AOPA 2023 calendar!

The calendar celebrates GA flying in New Zealand.

Photos should be current and must be available in high resolution.

Entries should be emailed to calendar.photos@aopa.nz for review by the judging panel. Thanks for those already in.

Promoting careers in aircraft engineering

Three new Aircraft Engineering scholarships have recently been awarded by the NZ Aviation Federation (NZAF) in conjunction with the Nelson Marlborough Institute of Technology (NMIT).

Acknowledging the growing industry problem of availability of Aircraft Engineers (as well as the low numbers of women entering the field), NZAF and NMIT, together with the NZ Assn of Women in Aviation (NZAWA), have awarded three new engineering study scholarships. The successful applicants were announced in early May at a formal function at NMIT in Blenheim.

Each of the NZAF scholarships has a value of $8000 and will be administered as tuition fees by NMIT, while NZAWA is providing support via a mentoring programme. A programme promoting aircraft engineering as a rewarding career option is being jointly undertaken.

Shar Illingworth (second from left) receives her Scholarship Diploma from AOPA NZ members Bernice Hintz (left), Margaret Wright (both NZAWA) and Ian Andrews (NZAF)

Bonanza upgrades

This issue we're very pleased to welcome Textron Aviation to our ranks as a major advertiser. Textron has recently introduced extensive up-grades to the Beechcraft Bonanza. You can read all about it in their advertisement on page 12.

Blue Light flying

Youngsters across the country were once again able to enjoy a flight during the annual 'Take a kid flying' event, thanks to the dozens of AOPA members who donate their time, skills and aeroplanes in support of the the NZ Police Force's Blue Light programme supporting children at risk.

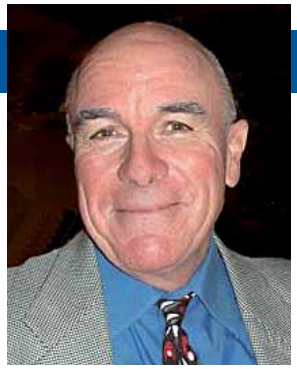
Thanks to all AOPA members who took part. As we heard from regions across the country, the smiles on the day said it all.

2023 AGM and Summer Safari

This year's AGM went online due to Covid, which also saw the cancellation of the 2022 Northern Safari. The good news is, we'll be returning to the north in 2023.

Whitianga will be the venue for formalities: Friday night welcoming BBQ (to be held on 3rd March 2023), AOPA NZ AGM (Saturday 4th March) and the North vs South Christine Taylor Memorial Golf Tournament (which will be played in the afternoon following the AGM). AOPA's AGM dinner will see everyone gathered that evening for chat, cheer and the announcement of the annual AOPA Awards.

From there, the gaggle will head to Waiheke Island, Taupo and Te Kuiti. There'll be fun, food and flying, adventuring and exploring. More information will be released as the time nears, so watch for your *Short Approach* emails and check the website for details. Accommodation bookings will be essential.



Vice-President's view

I recently undertook my BFR. It's always something I enjoy. With flying hours greatly reduced over the last two years due to Covid restrictions, I knew that some inevitable rust would be uncovered. A good thing, though, as it's a way to grade yourself alongside your instructor. You can't 'fail' a BFR, but you can perhaps be recommended for more training before the instructor will sign you off.

Depending on how I looked at it, conditions were perfect: 18 gusting 20 knots on the ground and 30 knots at 2000ft. It amounted to a 12 knot crosswind. That's a walk in the park for my 182 – but could I cope?

Once we got into it and did the obligatory stalls in various configurations it started to become fun. My Cessna 182 with the Peterson conversion doesn't really stall in the conventional manner, it just sort of starts to mush at about 38 knots – something my instructor always marvels at.

As we were about halfway through steep turns around a point, I noticed my standby attitude indicator was doing a strange dance and vacuum had gone to zero. It didn't really impact the rest of the BFR, but I knew it was going to hurt the bank balance.

After consultation with my LAME at Ardmore Aircraft Services, I decided to remove all the vacuum system and install an Uavionics AV30 customisable display. It was a straight plug and play once the wiring was done. I saved some weight and got an amazing piece of avionics. It can do most anything. The two things that really impress me are the density altitude function and the AOA (attitude of attack) indicator function. If you end up with vacuum failure, I strongly recommend this option.

The BFR finished with a crosswind landing, which earned me a compliment and got me signed off. I decided to go up again with my instructor to practise forced landing techniques, as I wasn't satisfied with my performance.

So that's a BFR done and something valuable learnt and more instruction to follow. You never stop learning.

Do you fly with your instructor between BFRs? I highly recommend it. You never know what you might learn.

2023 AOPA Northern Safari

Planning is well underway for the AOPA Northern Safari in March. It's going to have something for everyone, from some good strip flying to ziplining on Waiheke Island followed by a great lunch at the vineyard overlooking the airfield – and the fun won't stop there. Watch this space!

Steve Horne, Vice-President

From the Editor

How often has weather of one sort or another conspired to keep us from our winter treat? I've enjoyed many midwinter fly-ins at Omarama, but am yet to get to one at Haast. There will, of course, be members for whom the deferred date proved beneficial, but for Hamish and me it was impossible. Ah well, another year...

Next issue we'll have full coverage of the rescheduled – and reportedly glorious – AOPA midwinter fly-in, which took place as the magazine was being readied for print. A photo arrived just in time to grace the cover of this issue, while also giving a taste of exactly what we missed out on. In honour of the event, Haast features as this issue's 'Flying Getaway' destination.

Do get in touch if there is a flying destination close to your heart that you'd like to share with others. We're always looking for new places to fly.

I'd also like to encourage members to share their general aviation stories – and this issue it's been a delight to include contributions from Don Grant and Bernice Hintz. Bernice was a contributor many years ago, and it's great to hear from her again. Don's experience – and his willingness to share it – provides a note of caution from which we can all benefit. It made me wonder whether more of our members might have similar stories which it would be useful to share.

In this issue we also enjoy the next stage of David Berger's epic trans-global journey in a Cessna 185. As he and his son Tom make their way from Russia to Japan, their experience reinforces Don's message that things don't always go according to plan – and that when things do go wrong, it's often in a way we didn't expect. Both John Evans' safety column and Mike Busch's feature on the occasional failure of moving parts in piston engines reinforce this message, additionally offering advice to help manage and avoid risks.

Alongside our columns on aviation safety and flying destinations, a few issues back we introduced an aviation personalities column, in which we feature people who have made a great contribution to our industry, be they stand-out aviators, lauded instructors or renowned aviation characters – an AOPA 'Good Sorts' column... and it turns out that our industry has no shortage of candidates!

And while I'm on 'good sorts', thanks once again to Don Ryder and Ross Millichamp, who are the dream team in terms of helping pull each magazine together.

Fly safely, and I hope to catch up with some of you over the summer, perhaps in Whitianga...weather permitting!

Anna Mackenzie, Editor

When things don't go to plan...

By Don Grant

Easter Sunday dawned nice and fresh here in Albert Town. I had registered to go on the AOPA Omarama One-Day fly-in, doing some strips before the famous lunch at the 'Pink Glider' cafe. It had been quite a few years since my last AOPA fly-in; I think that was the winter of 2014, when we were snowed-in in Omarama on the Saturday.

In the meantime, I'd been busy in Motueka, flying around the Abel Tasman and Kahurangi National Parks whenever I could. It would be lovely to get some flying in now that I was living in the south.

My partner Nicky and I took off around 09:45 from Wanaka and landed about half an hour later at Longslip Station strip, in the Ahuriri Valley. Seven aircraft had preceded us and, after introductions, a cuppa and a chat, we all headed off through a side valley for Lake Ohau strip.

Now, I remember the Lake Ohau strip from a 2012 winter fly-in, as it was my first time doing country strips and I had my good mate, the late Trevor Leighton beside me for advice and to fly the trickier legs. We were in EFF, the Motueka Aero Club C172, and I took three attempts to get into Ohau. The first two I'd elected to go around as my profile wasn't right and I wasn't proficient at landing on narrow strips. The third time I landed about halfway down the strip where there is a hump. It was a smooth landing and I excitedly yelled to Trev, "I've done it!". He high fived me then quickly jumped on the brakes as we were rapidly approaching the end and I'd forgotten all about stopping, so excited was I at actually getting the Cessna on the strip.

Ten years later I was back, this time in my Piper PA20, ZK-PEE. I was following four aircraft and concentrating on the aircraft in front. I'd done my BUMPFF check but forgot about the feet, which I normally always do, a little left and right on the rudder to wake up my feet just before landing.

We three-pointed smoothly and were rolling out when the tail started drifting out. I compensated with some right rudder and it came back but then suddenly shot out to the left again, this time much quicker. This has happened twice to me in the past ten years – the Pacer is one of the most difficult tailwheel aircraft to control, being very short coupled – and previously I've been able to correct it no problem. Today was different.

This time I gave a healthy right boot to the rudder and toe break simultaneously. Immediately the plane turned 90 degrees right and then quite slowly eased over and onto her nose, propeller going from idle to dead stop in a half rotation of good Ohau gravel. Nicky and I were left hanging in our seats, looking at the dirt.

Avgas was running onto the ground from the right wing tank. I turned off the fuel and master switch and we were both outside in about twenty seconds. It was comforting to see the others running down the strip to help us. I was still not comprehending what had happened, but the main thing was that neither of us were injured.

Once we gently lifted PEE back onto her tailwheel, we found we couldn't push her as the right brake was locked on tight. Murray Paterson must have been carrying tools on him for out came a pair of pliers. After loosening a nut in the line to the brake, Murray was able to free it, then all the guys helped push PEE off the strip and out of the way.

This all happened in the space of about six minutes. I guess a little bit of shock set in. I was trying to figure out what happened, what we should do now, and how are we going to get out of there. The beauty about flying with a group such as AOPA is that there are always people to help you when things don't go according to plan. Luckily, with full mobile coverage at Lake Ohau, I was able to call my engineer, Callum Smith from Twenty 24 Aviation in Wanaka, and he quickly called my insurance assessor (who is based in the South Island).

PEE had recently come off a 100 hour check, including brand new disc brakes. Everything had been taken out of the

Nose-down in the Ohau gravel... but help, in the form of AOPA members, was at hand.

plane during the check, and I hadn't put my tie downs back. Murray offered me his tie downs and while I was on the phone to Callum the AOPA boys were getting PEE all secured. Meanwhile, others were helping Nicky and sorting out how they could get us to Omarama. Steve Lyttle in LAP offered to take Nicky to Omarama and Claire kindly gave up her front seat in FHR, which meant I had my first ride in a Bearhawk.

Once we were at Omarama it struck me that, were it not for all the great help from fellow AOPA members, we would have been right stuck. Everyone was very kind and, while still feeling a little numb, I was soon looking on the bright side of things, helped by a healthy dose of Tania's bacon butty from the Pink Glider Cafe. Steve Bunting had flown from Wanaka for lunch and graciously gave us a ride back. I was able to help Murray Paterson with hangarage for his Bearhawk for a couple of days, as I wasn't going to need it.

Callum quite rightly chose to get PEE lifted out by chopper – it turned out to be more cost efficient than three engineers and a hiab driving in, taking off the wings and empennage and trucking her back to Wanaka. Flight time for the chopper was a little over an hour, there and back.

Part of being a pilot is constantly learning and asking questions. I remember when BER, a Tiger Moth that I have a share in at Omaka, had an incident at Quail Flat while landing. It veered off the strip and hit a waratah. The pilot was able to get her airborne again and proceeded back to Omaka. A couple of days later he sat in the cockpit with the tail lifted off the ground and figured out that the boots he was wearing had caught on a lip of the sidewall, meaning he didn't have full rudder deflection, which caused the issue.

Three days after PEE's brush with the Ohau gravel, I was keen to figure out exactly what had happened. The insurance assessor came up as well and, after Callum had propped up the tail, I climbed in, wearing the same shoes I'd had on during the landing.

I replicated a sharp right rudder and brake shove, and what do you know: the toe brake hooked the chain of the

Left: PEE gets an airlift home courtesy a helicopter; the most cost-effective solution. Above: Nutting out the gnawing questions... Don's foot is shown here on the rudder as he searches for – and finds – one of the holes in the Swiss cheese.

right-hand brake and locked the right wheel! We tried it a number of times with the same result.

Now, I've got a big foot, a size 12, and the Williams STC for the toe brakes I'd installed in 2012 didn't have anything about installing a stop behind the brake.

With the tailwheel firmly on the ground it can't happen, but with my new disc brakes, a sudden and slightly panicked full hard right brake had lifted the tailwheel enough for the brake to move even further and hook the chain of the park brake.

At least that solved the gnawing feelings I'd been having about how the accident happened. A small block of swiss cheese with three holes lined up: me not paying attention to my feet upon landing, brand new and very effective disc brakes, and a panicked full right rudder and brake had caused the handbrake chain to pull on the right brake master cylinder.

Subsequent enquiries to a couple of Facebook groups associated with Pacers found a number of members recommending that you remove the handbrake chains entirely – it transpires that this has happened to Pacers a number of times in the past. Needless to say, I'll be buying a pair of aluminium chocks.

I've learned quite a few lessons from that Easter Sunday jaunt.

Always have your feet ready **before** you land a tailwheel plane.

Make sure your fuel caps have good rubber on them. I had one new and one old cap. The old cap was pouring out fuel from the right wing, while the left wing tank was as dry as a bone.

Please install full harnesses in the front seats if you haven't got them. Nicky and I would have been quite badly injured had we been wearing just lap belts. Hell, the dentist's bills alone would pay for the new belts. That's without the broken jaws, perhaps a broken arm and even spinal injuries. And we weren't going fast, about 30mph at the most.

Never have any heavy loose items behind you on the parcel shelf. Luckily all that hit us, as we were watching the prop grind in, was a toilet roll, sunscreen shade and an old map.

Think about what sum you should have your aircraft insured for. I'd left my insured sum the same for about ten years, and I'm extremely lucky, thanks to Damon Himburg and Bruce Drake, to have found a second-hand engine and propeller. Callum is currently repairing some of the bits, while we're buying some new parts as well. This has been a real eye opener for me: I was underinsured by about forty percent.

A word about my insurance. About three years ago I changed to Traffords, saving a few hundred dollars on my premiums. While they're based in England, they've been extremely helpful by using an independent insurance assessor. He ensured everything ran super smoothly and, a little over six weeks on, we were paid out to repair all the damage.

Four days after the incident I received a phone call from John Evans, on the AOPA executive committee, who kindly enquired whether there was anything AOPA could help with, and if there was any feedback I could give him. This article is by way of feedback, in the hope that it may benefit others in our industry. There is always something to be learned...

We're incredibly lucky to have such a great organisation as AOPA (amongst other flying organisations) in New Zealand. The way everyone rallied around with minimum fuss and helped Nicky and me that Easter Sunday was simply superb. That's wonderful airmanship and then some. We're all in the same boat and sometimes when you least expect it things don't go according to plan. Damn glad I'm a member of AOPA.

Wrong way to New Zealand: part 10

The escape from Russia

By David Berger

Climbing out of Ivanovka; inset: the mountains east of Kharbarovsk

Come Wednesday, Dmitri drove us to the Blagoveshchensk immigration office and we picked up our visa extensions from the beaming immigration officer, to whom we had submitted our passports five days before.

"Just make sure you're out of the country before the ten days are up," she said, with both a wink and a hint of menace. It did not escape our notice that this was the second time in twenty-four hours we'd been told the same thing by a Russian government officer, attired in that odd, turquoisey uniform they all seem to wear.

Dmitri drove us back to Fregat airfield owner Vladimir's office in Ivanovka and we said goodbye to him and his staff, thanking them profusely for all they had done. Truly, we would have been sunk without them.

We checked into our accommodation for the night – an AirBnB which turned out to be a tiny, Soviet-era studio apartment in a block made of now rotting concrete – took a last walk along the river to look at the light show from the Chinese side of the Amur, had a burger and went to bed, ready for an early departure the next day.

Time constraints, the vagaries of the autumn weather in Siberia, and our earnest desire to test neither the goodwill nor the flexibility of Russian officialdom any further, meant that we had asked Evgeny to cancel our intermediate stop in Khabarovsk with the plan of getting to Yuzhno-Sakhalinsk, 650 nautical miles to the east-south-east of Blagoveshchensk, in one hop.

Yuzhno-Sakhalinsk presents once again the odd Russian spectacle of a large city (200,000 population in this case) in the middle of absolutely nowhere. It sits at the southern end of the island of Sakhalin, immediately to the north of Japan's wildest island, Hokkaido. It began in 1882 as a convict settlement – a notable theme in these parts – when it was known as Vladimirovka. The Russians ceded the southern half of the island to Japan in the debacle that was the Russo-Japanese War of 1904, and didn't get it back until they cannily declared war on Japan again in the dying days of World War II and took the opportunity to settle a few local geopolitical scores.

The next leg after Yuzhno-Sakhalinsk would be a short hop to Chitose Airport on Hokkaido, in a country where travel arrangements may also be tortuous and torturous, but are rather less likely to end up in incarceration and a diplomatic incident due to circumstances beyond one's control. We were keen, friends, to get to Japan. Very keen.

It was therefore with a sense of dread and incredulity, as much as nausea, that I woke in the middle of the night to a violent attack of vomiting and diarrhoea. The next morning I was in no fit state to ride in a taxi to a chemist, let alone embark on a 650 nautical mile flight in a very slow light aircraft, but the weather was good and it was not due to stay that way. There was no option but to go.

Thankfully, the morning brought a let up in the night's sound and fury, leaving me eruption and eructation-free, but in a vacant, semi-fugue state. The weather was severe clear, the ride smooth and the first three hours passed without incident. Then, just as we were south of Khabarovsk at 8500ft, the Amur river winding to the north, I suddenly started to feel very faint. There isn't any recline in the seats in the Skywagon and you sit more or less bolt upright. I was sweating

and nauseous, my vision was fading. Tom said I had gone deathly pale and I realised the situation was rather dangerous. A faint in this position would leave me sitting upright with low blood pressure and, with no chance of lying down to allow blood flow to return to my head, thus setting the scene for a reflex anoxic seizure; an epileptic fit, in other words.

This was not a position I wanted to place my nineteen year old son in over the wilderness of the Russian Far East. We had over two and a half hours to run from Khabarovsk to Yuzhno-Sakhalinsk, entirely over forest, mountains and ocean. Khabarovsk was our last diversion possibility. We could land at Khabarovsk, a thought which neither of us relished, continue without improving the situation and risk an inflight medical emergency, or try to ameliorate my condition somehow.

I pushed my seat back as far as it would go and, with some difficulty, managed to slide down and contort myself into a cramped U-shape, my feet up on the dash, just about above my head. We opened the fresh air vents and Tom reached in the back to grab the portable oxygen, putting me on the nasal prongs at maximum flow. Over about twenty minutes, this seemed to do the trick and I reached a new equilibrium of ghastliness, but one at least which did not carry the imminent spectre of losing consciousness, and so we decided to press on.

By the time we got to the coast, I'd recovered enough to be awestruck by the sheer wildness of this part of the country, a wildness which I found incongruous. Since Russia has so little blue water frontage, one presumes that every inch of it would be 'in use' somehow, but that isn't the case. Books have been written about Russia's 'geography problem – its lack of oceanic access and the poor usability of the frontage they do have – and it was striking to see it so graphically illustrated first hand.

We had deliberated at length over whether to wear our immersion suits for the hundred mile crossing to the island, but it would have meant wearing them for the whole flight and in the end we couldn't face it.

The clarity of the day and our ability to see Sakhalin from far out offered us a welcoming, if false, sense of security,

Tom with our battered old workhorse at Yuzhno-Sakhalinsk, our last stop in Russia

which we were both glad to accept and not question any further.

Before long, we were descending over the trackless forests of Sakhalin island, which soon gave way to the city, nestled in a valley, a large bay to its south, over which we approached to land to the north. We were marshalled in, across that ocean of concrete which seems to characterise these regional Russian airports, and directed to stop in a place indistinguishable from any other place.

As soon as Tom pulled the mixture and the aircraft had been immobilised by the customary Soyuz-sized red chocks, I pulled the door handle and flopped out onto the ramp, where I lay flat on my back for the next hour, to the consternation of the smiling lady handling agent, who had driven out to meet the aircraft. As I luxuriated in the feeling of solid ground, vowing never again to eschew its undoubted advantages for the fickle attractions of the sky, Tom hand pumped two fifty-five gallon drums of avgas entirely on his own. I didn't care. I was having my own private love affair with the earth of Mother Russia.

Of that night, in a small, anonymous hotel in another rather grey city in Russia, I remember little, except that it was cold.

The next day we were back at the airport to go through the departure rigmarole for Japan. I was still in an extremely frail state and there seemed to be an awful lot of people involved in facilitating our departure. Eventually, we found ourselves riding a huge airport transfer bus out to the aircraft, accompanied by our handling agent, customs and immigration officers and three FSB (the discreet, modern word for KGB) agents. Everyone was polite enough, at least until I tried to take a picture of the assemblage, but it felt as if our departure was very firmly 'required'.

We got out, prepped the plane and started up. The bus stayed in position until we had taxied off, as if to make sure we really were going to depart. They needn't have worried. By now we were more than eager to get going ourselves.

The flight to Hokkaido from Sakhalin is short and the weather was still good, with just a little low cloud and fog in the strait, often a gotcha for VFR pilots on short sea crossings. As we crossed the coast, we couldn't help but be struck by how, well, Japanese everything looked: neat, rectangular fields, small houses, everything tidy and geometric; quite unlike the human landscape of Russia.

We were met at Chitose airport by Peter Steeger, a German pilot who has lived in Japan for years and handles many GA flights through the country. The bureaucracy is as labyrinthine as it is senseless, especially once you're making flights between domestic airports, as we were doing, and doubly so when one of them – our next stop, Fukushima Skypark – was a private airfield. It would be very hard to negotiate without expert assistance from someone on the ground.

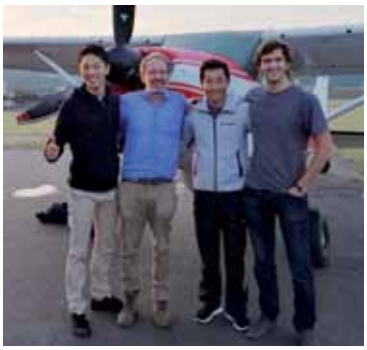
I was particularly charmed by the Japanese telephone greeting Pete used, "Moshi mosh!", delivered in a soft, unthreatening singsong. Add the installation of animé dolls in the terminal and things were starting to look and feel very unRussian, a fact which elated us more than it decently should have.

We paid a visit to the flight briefing office, which had staffing levels and piles of paper reminiscent of a 1970s bank, and had a nice chat with Pete and his assistant at the terminal café about the ups and downs of GA flying in Hokkaido, which seemed pretty similar to everywhere else. Faraway places always become so much less exotic when you get under the skin of local life and realise that their reality is just as everyday for the people there as yours is to you. It's a reassuring finding.

I took the opportunity in the terminal to reacquaint myself several times with the extended feature range of Japanese toilets and after that we were on our way, climbing out to the south-west for the port of Hakodate on the tip of Hokkaido, from where we would cross to Honshu and our destination of Fukushima Skypark, several hundred miles to the south.

Fukushima Skypark is the home airfield of Yoshi Muroya, Red Bull Air Races champion, Japan's foremost aerobatic pilot and a celebrity of epic proportions in his home country. When the offer came from a friend of a friend, who also happens to be a New Zealand Cessna 180 owner, to put us in contact with Yoshi to host us, I lunged for it like a drowning man for a Carley Float. There followed a lengthy to-ing and fro-ing of emails to secure permission for a stopover from the Air Ministry. Eventually, we thought we

Left: Fukushima Skypark, home field of Japan's celebrity aerobatics champion, Yoshi Muroya.
Below: David and Tom with Yoshi.



had it all sorted, though in the end Peter Steeger still had to tick some bureaucratic box or other to get it over the line.

The airfield sits in a spectacular location on a plateau in the Azuma mountain range, high above the city of Fukushima, over which it holds a commanding view. Fukushima bore the brunt of the 2011 tsunami and you still can't walk fifty metres in the prefecture without coming across a Geiger counter displaying the level of radioactivity at your location to reassure you that the leak from the damaged reactor hasn't got any worse. (It doesn't reassure you, by the way.)

Flying a single-engined aircraft in Japan is not for those who dwell compulsively on 'what ifs?'. If the engine quits over most of Japan you are in big trouble. Japan's population of 125 million is crammed into the small proportion of relatively flat areas, making them mostly unsuitable for emergency landings, though infinitely more suitable than the rest of the country, which consists of jagged crags and mountains, mostly covered by forest and riven by gorges of terrifying precipitousness. Coming upon Fukushima Skypark then, a flat, immaculately grassed expanse with an 800m hard runway, in the midst of terrain which is anathema to airplane pilots, was balm to our aviation eyes and souls.

The welcome from Yoshi, his mechanic and his publicity team was beyond kind, and soon our utility Skywagon, dented and battered from its 10,000 hour working life, was nestled up incongruously amongst Yoshi's immaculate flock of Extras: brothers from very different mothers.

Over the next several days I mostly lay up in a hotel in downtown Fukushima and continued to lose weight, though I did manage to at least be present while Tom did our third oil change of the trip, even if that presence consisted only of shouted (and unnecessary) advice from my now customary recumbent position on the tarmac. Some rather nasty weather passed through and we came to understand that flying through Japan in October entailed carefully timed hops between places of safety to avoid the regular sequence of cyclones which sweep down the country.

While we were there, Yoshi did a photo shoot for Lexus, one of his sponsors, and we got to observe his demi-God-like status first-hand as the publicists and various hangers-on scurried around him; respectful, certainly, but also firm in what they needed him to do and the part he must play. His had the air of a gilded cage existence which most would find trying, but he handled it with great dignity and aplomb.

It is hard for Westerners in Japan to cease marvelling at the apparent two-thirds scale of items of everyday life, from furniture, to cars, to houses. In this era of increasing global uniformity it is a pleasure to be challenged in such a way and we thoroughly enjoyed our time in Fukushima, an unexceptional city, in which we did nothing special at all. The sight of a young man at the table next to us in our hotel live-streaming the eating of his breakfast to the Internet – not even commentating on it, just streaming it – is not one easily forgotten.

Spotting a gap in the weather, we filed an IFR flight plan for Kagoshima, at the very southern tip of Kyushu, about 600 nautical miles away and our jumping off point for Okinawa. We climbed west out of Fukushima Skypark over a sobering gorge, but thankfully the terrain was soon partially hidden from view by the day's cumulus build-up, making our way down the west coast of Honshu to keep us well away from the Tokyo conurbation. Fuji-san saluted us from a distance as we crawled past, the weather deteriorating somewhat as we approached Kagoshima, but this did not provide too much of a test for Tom's still nascent instrument flying skills.

Waiting for us in Kagoshima were our old friends, Barry and Sandra Payne, the Bazflyers, who had made their way directly there from Vladivostok, a long leg made longer by a very wise dogleg to avoid North Korean airspace. They had arranged hangarage for us in a flight school run by an ebullient and extremely helpful Italian called Paolo, who had lived in Japan since childhood. Soon N185MW was happily ensconced in a sturdy hangar next to the Bazflyers' immaculate Comanche. We rented a car and repaired to a nearby hotel to wait out the next cyclone and resume our diligent study of Windy.com.

The next leg to Okinawa would be 400 nautical miles down the chain of the Ryukyu Islands, with another 850 nautical miles from there to Clark Field in the Philippines. Australia was still far, but we were now running down a line of longitude towards it, rather than crossing lines of latitude well above it. For the first time, we were starting to compute when we might actually arrive there.

Bedded down with an old friend – last seen in Vladivostok – in Kagoshima on the island of Kyushu

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By John Evans

See, be seen and avoid

When flying enroute in New Zealand, what frequency are you on? You might be on an allocated frequency (CTA/CTR/MBZ/CFZ), the unattended aerodrome frequency 119.1, a chat frequency, or a FISCOM frequency.

I recently talked to CAA Aviation Safety Advisor, Carlton Campbell, about frequency ambiguity enroute. We agreed that it exists, but also agreed that when we fly enroute, we rely on far more than our radio broadcasts for separation.

"Right of Way rules (CAR 91.229), VFR cruising altitude and flight level (CAR 91.313), and basic lookout airmanship are critical to avoiding other aircraft," he says. "Confusion over the correct frequency, and an excess of radio calls, do not enhance safety, whereas the previous three do; in fact, incorrect frequency and excess calls can provide a false sense of security."

In this column we focus on what comes first and foremost concerning collision avoidance enroute: see, be seen and avoid.

See. The first and foremost mitigation is visual recognition, courtesy of your eyes. With your eyes outside the windscreen most of the time, you are visually scanning. Scanning techniques are well publicised; CAA instructional material recommends the 20 degree per 2 second visual scan technique, allowing time for your eye to focus momentarily on an area and send a sharp image to your brain for processing.

Peripheral vision is effective at spotting collision threats, and also comes into its own for night flying.

Be seen. Firstly, visual conspicuity (strobes, landing lights and navigation lights). Some designated airspace requires conspicuity aids to be on if fitted, and elsewhere there are not many reasons why you would not have them on at all times, assuming daytime VFR. The colour scheme of your aircraft is also a significant factor.

Secondly, electronic conspicuity. A radio, clearly useful if you are on the same frequency as the other aircraft, allows you to make clear concise radio calls appropriate to the area/traffic density and to build a mental map of where other aircraft are. A transponder/ADSB-Out is handy for others who are able to interpret Mode S/ADS-B. This can be as easy as having a tablet/phone and an ADS-B receiver.

This is a subject has been discussed extensively and well (refer *Vector,* Spring 2021). ADSB-In traffic information works well within your flightdeck workcycle scan, but is not a substitute for your eyes outside. Carlton also raises a perhaps less obvious point: "Outside controlled airspace, aircraft without ADS-B, or with it turned off (not a wise practise), will obviously not be visible electronically, and so your good lookout is your only defence from collision."

See and be seen also relies on separation from clouds, with margin, and visibility in front of you. The cloud separation margin allows for IFR traffic to go from being IMC (in the cloud) to visual with enough separation (time) to visually identify other airspace users when they emerge from the cloud. Sufficient visibility in front of you gives you enough time to spot other aircraft. The CAA VFR Met Minima card is a useful resource should you need a refresh.

Avoid. Next, Right-of-way rules per CAR 91.229 and VFR cruising altitude per CAR 91.313. Check how they apply to you and your aircraft. Generally speaking, for two powered aircraft, if head on, go right; if passing, go right; if on a converging course, give way to the aircraft on your right.

VFR cruising altitudes, at/above 3000ft AMSL/1000ft AGL (whichever is higher), northerly headings, odd thousands plus 500ft; southerly headings even thousands plus 500ft.

Utilising valley/coastal flying conventions (when conditions allow) is good aviation practice (right side of a valley and right side of a line feature, for example, the coastline). Setting the right QNH for the area you are enroute within (irrespective of what your GPS says), refer AIP ENR 1.7-2 for the zone map, is important for separation enroute and when broadcasting your altitude within position reports.

Back to frequency ambiguity. How can we address this?

I have purposely made no attempt to do so in this column. What really counts is application of the VFR flight rules and established conventions, complemented by the hardware and all the technological tools in your toolbox, all within your flightdeck at the hands of you, your eyes and ears.

Carlton, an active GA pilot, sums it up nicely: "The only fool-proof way of avoiding a collision is to see the other aircraft. All other mitigations are merely aids to that lookout."

Best practice for running in

Jay McIntyre is the owner, LAME and IA of JEM Aviation, Omaka

By Jay McIntyre

A recent prop strike incident prompted a couple of thoughts around running in a new engine and prop.

Also, do remember when you are taxiing between different surfaces to approach the change in surface at an angle. This will lessen the chance of the nosewheel coming to a dead stop while momentum tries to keep the aircraft moving, causing the nose oleo to compress and the nose to go down, with a corresponding contact between the prop and ground. In a recent case, the prop never stood a chance as there was a 2-3 inch difference between the height of the grass and the repaved taxiway. (One might wonder if the airport authority should be held accountable?)

The subsequent engine and prop change was a pleasant affair as we had a spare engine and prop to go on the aircraft, which meant that we were able to carry out the first operation check flight of the engine the day after starting the engine change. Nice not to have a three month gap between fitting the engine and prop and the subsequent 'how was that line routed' or 'where was that widget fitted' head scratchers.

When it comes to the engine break-in, this has been subject of various old wives' tales, such as 'give it death' or 'climb it like a homesick angel'. I've found that following (in Lycoming's case) SI 1427C gives really good results.

First off, carry out a hot oil prime. In this case, we were in the field and it was not practical to bring the hot oil primer, so we stuck the bottles of S100 oil in a bucket of boiling water to warm it up and, with the plugs out, turned the prop over on the starter until oil pressure registered.

As soon as the hot oil prime was carried out we refitted the plugs and, with the oil still hot/warm, carried out the initial engine run. Within reason, keep the ground runs to the absolute minimum.

In the case in question we ran it for under five minutes before ascertaining that all temps and pressures, engine controls and so forth were as they should be. Obviously, if something is not meeting spec you will have to carry out adjustments and the like but, by the same token, it is equally counter-productive to faff around trying to get something adjusted to within an inch of its life if it is generally within limits and safe. It will probably only change as the engine breaks in anyway!

Once ready to carry out the first flight it is usually quite productive to advise ATC of the nature of your flight so that they understand you do not want to be holding at Alpha 1 for fifteen minutes. The less time on the ground the better. Having everything prepared and briefed prior to engine start will bring dividends for your engine in the long run. Once started, don't dally, but equally don't put yourself under pressure so as to compromise safety. Carry out a normal run-up. I photograph the Ts and Ps for analysis later. It's also a good idea to carry out a Static RPM check if the design/power of the airframe/engine will allow. You may well find this a little lower than expected due to the new nature of the engine components, but, like all maintenance engine runs, it will give a benchmark against which things can be compared later.

Once airborne, maintain a slightly lower nose attitude than is perhaps usual. This will allow better cooling airflow to the engine. Stay within gliding distance of the airfield for the first half hour – better safe than sorry! I normally aim for about 2500ft, as this is high enough to carry out a precautionary or forced landing if necessary. Lower altitudes also help maintain manifold pressure, which is critically

important for maintaining pressure on the piston rings to help them bed in. (This is why the old wives' tail of climbing as high and hard as possible is detrimental: first, MP drops as altitude increases; second, climbing affects cooling airflow; and third, you have to get back down without closing the throttle!) Lycoming recommends 75% power for this, which for most O-### series engine is at 2400 RPM. Remember it is not 75% of throttle lever throw!

I normally make the first flight no longer than thirty-minutes, as it is good to get back on the ground so you can ensure there are no oil leaks and that everything is as it should be.

From here I top the oil off, if required, to a nice round figure so that consumption can be monitored easily. It is important to note that just because the oil capacity says six quarts, it does not mean you have to put six quarts in. If you look at the manual for your engine, you'll find that the minimum oil level is disturbingly low compared to that at which you might usually operate. In this case we left it as it was at just over four quarts and, as everything was in order, we headed off for an hour, initially at 2350-2400 RPM and 3000 ft. Lycoming recommends half an hour at Wide Open Throttle (WOT), which we set after reaching cruise altitude and having let things settle down after the climb. Gradually, as the engine freed up, WOT exceeded redline so we had to continually nudge the throttle back a bit to keep just below redline.

After two hours we landed back at base to find barely any oil on the belly from the breather and, after letting the engine cool and oil level settle, our oil level was dead on four quarts. Very pleasing! A note was made on the baffle adjacent to the dipstick that oil should not be added unless below this level, and when it was required, only enough should be added to bring it up to four quarts. This is an important thing for users such as Aero Clubs, with multiple users of their aircraft, to do, I think, as it will allow an accurate assessment of oil consumption.

The above steps complete, all that is left to do is to fly at 65-75% power until oil consumption is assured as being stable. It probably pays to fly at these power settings for at least ten hours, which means that circuit training, stalling and such are off limits. I think it is probably best to restrict usage to cross-country flight only for 25 hours.

A failure to rotate

Is conventional wisdom wrong about why exhaust valves burn?

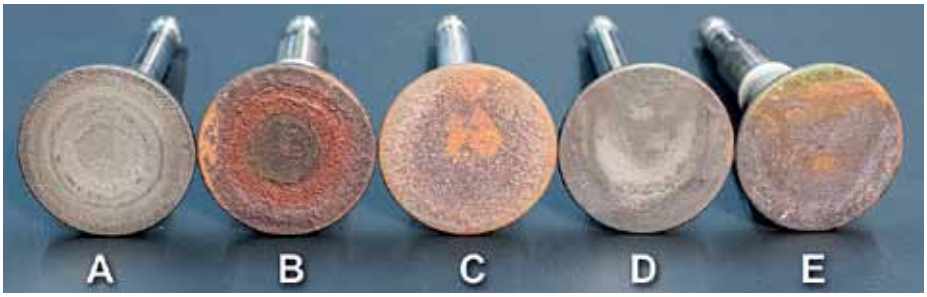
By Mike Busch

Piston aircraft engines have a lot of moving parts. Way too many, if you ask me. The thought of thousands of separate metal parts reciprocating, rotating, wiggling, wobbling and rubbing against one another thousands of times a minute is something I try hard not to think about while airborne, mainly because I fly a lot better when not distracted.

Of those thousands of moving parts, two kinds are the most worrisome: the ones most likely to blindside you with a costly, premature, unbudgeted-for engine overhaul or replacement, and the ones most likely to make you fall out of the sky (or at least soil your undies).

The biggest offender in the safety-of-wallet category is the camshaft – and for Lycomings, the cam followers (aka tappets) – which present by far the leading cause of premature engine teardowns. (Especially if you don't count prop strikes, which you really shouldn't since the propeller isn't part of the engine.)

In the safety-of-flight category, hands-down the most-wanted villains are exhaust valves. Exhaust valves can ruin your day in at least two different ways: they can stick or they can burn. Although these problems can occur in any piston aircraft engine, sticking is much more common in Lycomings and burning is more common in Continentals. In this column I'll focus on what we've learned about burned valves.



Line-up of five Continental exhaust valves. The left ones look healthy, the right ones don't.

Don't blame the pilot

After I purchased my first airplane in 1968 – a new Cessna 182 Skylane powered by a Continental O-470-R – it didn't take long for me to recognise that exhaust valves were the most vulnerable components of my engine. Burned exhaust valves were the principal reason cylinders flunked the annual compression test. In those days, anything less than 60/80 was considered unairworthy and condemned the cylinder to removal and replacement or rework. Mechanics invariably blamed burned exhaust valves on pilot mismanagement, and warned us not to lean our engines aggressively so we wouldn't overheat the valves and cause them to burn. The standard A&P mantra was 'Fuel is cheaper than engines'.

Single-probe exhaust gas temperature (EGT) gauges were just coming into vogue and we were taught that the best way to prevent exhaust valve problems was to avoid operating at excessive EGTs. The implication was that EGT was a good proxy for exhaust valve temperature, and that keeping EGTs cool would assure that exhaust valves wouldn't overheat. This all sounded logical and convincing at the time, and most of us believed it.

But it turned out to be complete hogwash. If high EGTs were the cause of exhaust valve burning, then low-compression engines like the O-470-R in my Skylane would suffer more burned exhaust valves than high-compression engines like the IO-520-K in the Bellanca Viking I owned after I sold the Skylane. After all, a high-compression engine inherently has much lower EGTs than does a low-compression engine, because the high-compression engine is more efficient at converting the heat energy liberated during combustion into mechanical energy (horsepower) and so wastes less heat energy out the exhaust. That wasted heat energy is what we see in the cockpit as EGT, and it's inversely correlated with compression ratio.

Of course, it's simply not true that high-compression engines suffer fewer burned exhaust valves than low-compression engines. There is no statistically significant correlation between EGT and exhaust valve burning. It's a myth. Nor is aggressive leaning the culprit. In the 3300 hours that I put on the twelve cylinders of the Continental TSIO-520-BBs in my Cessna Turbo 310 before finally retired them, I never suffered a single burned exhaust valve, and those engines were always leaned aggressively, almost exclusively lean-of-peak except for take-off and initial climb.

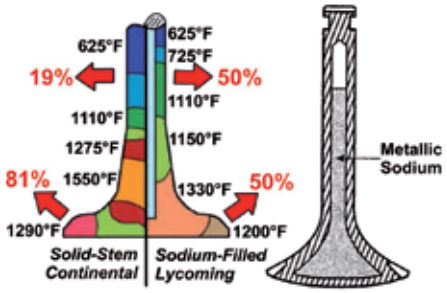
No, when an exhaust valve burns, it's almost never the fault of the pilot. This turns out to be just another myth. But if it's not the pilot's fault, whose fault is it?

The short answer is that it's generally the fault of the hardware. And that's where the story really starts to get interesting.

Survival strategies

Exhaust valves must survive in an atmosphere of incredibly hot and corrosive gas whose temperature can reach 4000°F at the peak pressure point of combustion. To make matters worse, the valve stem must oscillate smoothly through a valve guide without benefit of lubrication (since the stem runs so hot that engine oil would just carbonise). It's a miracle that these valves last as long as they do.

Key to the exhaust valve survival is the valve's ability to shed this intolerable heat by transferring it to the cylinder head, which acts like a giant heat sink for the valve. There are two ways the valve can transfer its heat to the cylinder head: via contact between the valve's head and the valve seat (when the valve is closed) and via contact between the valve's stem and the valve guide (constantly).



Continental's solid-stem exhaust valves dissipate heat quite differently than Lycoming's sodium-filled valves.

Continental and Lycoming employ subtly different construction and heat-sinking strategies for their exhaust valves.

Continental valves have solid stems and heads made of an exotic nickel-chromium superalloy called Nimonic, known for its high-temperature, low-creep characteristics. Lycoming valves are made of not-so-exotic stainless steel, but have hollow stems partially filled with metallic sodium that has the consistency of toothpaste at room temperature, an unusually low melting point (208°F) and high boiling point (1621°F), plus exceptional thermal conductivity. The sodium liquifies as the valve starts to heat up, sloshes back and forth inside the hollow valve stem, and greatly improves transfer of heat from the head of the valve to the stem.

As the graphic above indicates, Continental's solid-stem exhaust valves shed their heat predominantly through contact between the valve head and the valve seat, while heat dissipation of Lycoming sodium-filled valves is split evenly between the head-to-seat interface and the stem-to-guide interface. That's why a close-tolerance fit between the stem and guide is essential to the survival of Lycoming valves, while Continental valves can usually cope with sloppy-fitting guides so long as the head of the valve makes firm, leak-free contact with the seat throughout its entire 360° circumference when the valve is closed (which it is about two-thirds of the time).

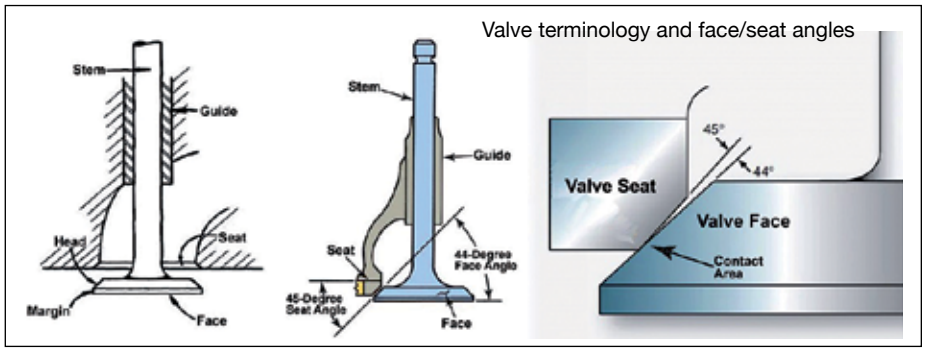
Threats to survival

Exhaust valves burn when the heat transfer path from the valve to the cylinder head is compromised.

If the valve loses its heat sink, it can overheat and start to warp and, possibly, start to crack around the edges. This causes it to lose its seal with the valve seat, allowing extremely hot combustion gas to leak past the valve during the hottest part of the combustion event when the valve is supposedly closed. The escape of this extremely hot gas results in metal erosion and warping, which increases the leakage of hot gas past the valve. Lather, rinse, repeat, and soon the valve is toast.

Sometimes this is baked into the cake when the cylinder leaves the factory or the engine shop. For example, if the valve guide and valve seat are not perfectly concentric, the valve won't seal perfectly around its entire 360° circumference.

There was a period during the 1990s when the Continental factory stopped 'post-reaming' valve guides after they were installed in the cylinder, and instead was pre-reaming them prior to installation. That turned out to be a really bad idea and resulted in serious concentricity issues. We started seeing large numbers of Continental exhaust valves burned



Failed Lycoming rotator cap (left) resulted in a hot spot on this exhaust valve (center). Lapping the valve in place and installing a new rotator cap resulted in a healthy looking valve 10.7 hours later.

after just 400 to 500 hours in service.

Eventually, Continental went back to its tried-and-true post-reaming process and the concentricity problems largely went away. (For a while at least... read on.)

Grinding the valve so it makes proper contact with the seat is harder than it sounds. The overhaul manual calls for the face of the valve to be ground at a slightly different angle than the seat angle in order to provide a narrower contact footprint that will seal better. It turns out that this is tricky business. If the contact area is too wide the valve won't seal well, but if it's too narrow, the heat transfer path from the valve face to the seat is compromised.

Valve and seat grinding is as much of an art as a science, and some engine shops do it better than others. Doing it right is particularly important for Continental valves because they are so dependent on face-to-seat heat transfer.

Lycoming sodium-filled valves are more dependent on the stem-to-guide heat transfer path, so worn guides have a sloppy fit to the valve stems, which can lead to burned valves. This is one reason why Lycoming recommends regular 'wobble testing' (Service Bulletin No. 388C) to check for play in the stem-to-guide interface. This is much less important for Continental engines, which tolerate worn guides far better.

Failure to rotate

Rotation is also essential to exhaust valve survival. Most Continentals and Lycomings employ exhaust valve rotators – Lycoming calls them 'rotator caps' and Continental calls them 'rotocoils' – that cause the valve to rotate a fraction of a degree each time the valve opens. At typical cruise rpm, the valve typically rotates a full 360 degrees each minute.

Exhaust valve rotation accomplishes two things: it ensures that the heat load is spread evenly and symmetrically across the face of the valve, and it prevents the development of hot spots that can cause the valve to warp and then to burn. Rotation also helps prevent the formation of deposits on the valve seat that can interfere with the valve's ability to seal properly.

In recent years at Savvy Aviation, we've been finding an increasing number of burned valves caused by failure of the rotator, particularly in Continental engines.

The Continental rotocoil contains a garter spring that gets laterally 'squished' every time the valve opens, and it's the squishing of the spring that produces the rotation. Unfortunately, this squishing action also causes the spring to wear and eventually it wears enough that the rotocoil stops rotating the valve. Once that happens, it doesn't take long for the non-rotating valve to develop a hot spot and eventually burn beyond salvation. We've had the feeling that these roto-coil failures are happening a lot more frequently than they used to. There may be a good reason for this. It turns out that Continental's vendor (Federal-Mogul, formerly TRW) made some subtle changes to the rotocoil that seem to

Continental rotocoil disassembled, showing the garter spring(top). Two garter springs, one in good shape, the other badly worn (bottom).

Badly burned exhaust valve, and the same valve 1.7 hours after the valve was lapped in place and the failed rotocoil replaced.

have adversely affected its longevity. The older rotocoil (part number 629117) used a larger-diameter garter spring and was held together by a circlip, while the current rotocoil (part number 652112) uses a smaller-diameter garter spring, has no clip, and seems to be failing more quickly, sometimes after as few as 500 hours.

The good news is that it's pretty easy to detect exhaust valves that have stopped rotating simply by inspecting them with a borescope. A valve that is rotating properly will have a symmetrical appearance, the way valves A and B in the line-up on page 16 do. Valve A is cleaner because it has been operated mostly lean of peak (LOP), while valve B has more deposit build-up because it has been operated mostly rich of peak (ROP), but both are symmetrical and healthy-looking. Valve C exhibits subtle signs of asymmetry, probably because its rotocoil has started to fail. Valve D is profoundly asymmetric and definitely not rotating, though it hasn't burned yet and might just need a new rotocoil. Valve E is also not rotating and has started to burn, though there's a good chance the valve could be saved by lapping in place and installing a new rotocoil.

It's amazing how quickly a failing valve can heal if it's caught early enough. Look at the striking before-and-after photo (at top left) I received from Dr Gary Silver, an A&P/IA who owns, flies, and maintains a Cessna 421 powered by a pair of Continental GTSIO-520s. The photo shows a borescope image of a badly burned number 4 exhaust valve in Silver's left engine, and another image of the same valve only 1.7 hours after Silver lapped it in place and replaced the failed rotocoil. Remarkably, the nasty hot spot has almost completely disappeared.

What about Lycomings?

Lycoming exhaust valves use a completely different style of rotator and we don't see them fail nearly as often, but it does happen occasionally. The Lycoming rotator is a small cap that sits on top of the valve stem. The photo (far left) shows one that exhibits a deep linear groove worn by the tip of the rocker arm – a sure sign it's not rotating. This one made it to 1362 hours before the failure was discovered.

Lapping the valve and replacing the rotator cap resulted in a much healthier-looking valve when it was borescoped again 10.7 hours later.

Here are the key takeaways: burned valves aren't your fault, they're almost always a hardware problem. If you inspect your cylinders frequently (at least every 100 hours; 50 would be even better), you can catch valve issues early and avoid the need for cylinder removal. The borescope will show whether the valve is a viable candidate for lapping in place. Always replace the rotator when you do this. A follow-up borescope inspection 10 to 25 hours later will hopefully confirm you dodged the bullet. Pulling the jug should always be treated as the last resort.

Mike Busch is a CFI, A&P, IA and regular contributor to *AOPA PILOT*. Article published with thanks to Mike Busch and AOPA USA.

Saving it for the next generation

From the structural to the personal, Bernice Hintz recounts the history – and herstory – of her Bolkow, and reflects on the team involved in keeping her in the air.

If you want to know the structural history of an aircraft, you look at the technical logbooks.

By my calculations, in 57 years ZK-CJE (Emma) has had:

- 2 engines (both having had at least one rebuild)
- 2 exhaust systems
- 2 ignition harnesses
- 2 nose leg rebuilds
- 2 seat reupholsters
- 2 transponders (Terra and Garmin ADSB)
- 2 turn and slip indicators (now replaced by Garmin G5)
- 3 ELTs
- 3 rear bulkhead rebuilds
- 3 starter motors
- 4 canopies
- 4 paint jobs
- 4 radios
- 27 compass swings
- 57 oil changes @ 5 litres per change = 285 litres of oil.

The airframe has done 5600 hours which, at 22 litres per hour, have burned through 123,200 litres of Avgas.

She has covered half a million nautical miles (to the moon and back and to the moon again).

Her empty weight has fluctuated from 861 lbs to 872 lbs.

Ten Bolkows were imported by Syd Jensen in the mid 1960s. As far as I know, seven are currently airworthy. Three are in need of some tender loving care and a few buckets of money.

'Emma' first flew on the 18th February 1965. Operated by Tauranga Aero club from 1965 to 1972, Ron and Frances Hintz from 1972 to 2000 and by me from 2001 onwards, she has been part of our family for fifty years.

The other side of history

If you want to know the personal history of an aircraft, you look at the pilot's logbooks. Where it has flown, who flew in it and what route they took.

Looking at my dad's log books, I can see he did a lot of local flights around Te Puke. Neighbours, school groups, search and rescue, movie scouting for filming sites, recognisance for tramping trips. I can see when he started training for aerobatics. There were a couple of long-haul trips to the South Island – Timaru, Queenstown, and Christchurch. I know one trip was to Christchurch to attend my wedding in 1993. Great Barrier Island seemed to be a favourite. I can trace family holidays to National Park and Pauanui. We drove, he flew. Dairy Flat, Te Kowhai, New Plymouth and Gisborne were also popular.

When Dad died, the attendees at his funeral signed his logbook. I have a memory that it was Alec Tait and John Galpin who suggested that I should keep CJE; I see they signed his logbook, so they were definitely candidates. There were many

comments recording thanks for flights he took people on. A few people carried on to gain pilot's licences after getting a taste of flying with him.

My logbook has many fits and starts. A lot of it can be traced to availability of flying money and maintenance issues. Under my ownership, Emma has been to Rotorua from Christchurch, Wanaka from Napier, and Taieri from Hawera. We've landed at Charlie Draper's strip near Darfield, and at Cape Campbell. At the other end of the spectrum, we've braved Wellington and Christchurch Internationals.

She hasn't got long legs but it's a great adventure flying her to faraway places, especially now she has a friend to fly with.

Team effort

Graeme Phipps and Pat Scotter started my 100hr/ARA in July 2018. It came to an abrupt halt when they did the leak down checks. I knew it was serious when they disappeared into Pat's office and started discussing the findings. The engine was declared below par. After forty odd years it wasn't unexpected. I flew it the short hop home and had a long, hard think about what to do next.

New engine, rebuild engine, part it out, or museum piece?

Enter Graeme Daniell at Southair. I rang him with my dilemma. We talked through the options, and he gave me realistic quotes. A few months later Graeme Phipps and I prised the engine into a box and loaded it into the back of my Honda Civic to take to Taieri. Over the next few months Graeme's engineers rebuilt my girl's heart. I think he even came in under budget!

It took some time working Saturdays only with the other Graeme (Phipps) to reconnect her back into the airframe. Finally in late 2019 she lived/flew again.

ADS-B and Garmin G5 upgrade

In 2020 Dave Harnett and Muhammad Hidyat (Mo) at Avionics Canterbury Wide installed and spruced up Emma's instrument panel. Ironically, Mo had been one of my students a few years previously at Air New Zealand. Now I was paying his wages rather than him paying mine. Swings and roundabouts. I love the new colour mini TV screen (G5), but not so much the new all-seeing ADS-B.

Emma also now has a new home in Hawera. Flying out of Taranaki means any flight in the early morning is into the sunrise and any flight in the late afternoon is into the sunset.

Emma's canopy, after fifty years, was badly scratched and cracked around the storm window. I decided to source a new one. After asking around I found they still made them in Germany.

I called in my friends from Southair. "Graeme do you reckon you could ship a canopy from Germany for me?"

The worldwide freight companies had just had the Suez Canal blockage to deal with, so shipping was slow to say the least.

"No worries, leave it to us," says Graeme. I did and Santa delivered it in a big box in time for Christmas 2021.

While Emma was there, I decided she could do with a new paint job (It had been forty years since her last repaint). When I got Emma in 2000, I reupholstered the seats in a colour scheme of purple and cream. It took me twenty years to finish the rest of the aeroplane. Now she is resplendent in Cadbury purple, cream and cerise (pink).

Above: Before and after panel upgrade, carried out in 2020. Previous page: Emma's new colour scheme of purple, cream and cerise.

I can't speak highly enough of the work that Southair has done on Emma. She looks and flies like a brand-new aeroplane.

The controls are crisp and responsive. She is perfectly rigged. I can fly her hands off. When I wash her, the dirt just slides off. Only problem now is that she is so shiny the water spots show.

Graeme consulted me every step of the way. He communicated problems straight away and asked if I wanted extra work done or not. With a 57 year old aircraft, of course there were going to be issues. The best/worst find was that the rear bulkhead had a couple of cracks in it. Nothing for it but a rebuild.

Emma is now resident in her own new hangar in Hawera with ZK-CAW, and all good for another 50 years of flying.

Thanks to: Advanced Fibreglass; Dave and Mo, Avionics Canterbury Wide; DB Graphix; Gary Montagu, test and ferry flights; Graeme Daniell, Southair; Graeme Phipps, a very patient engineer; Mark Smaill, painter; Neil Hampton and Nadia Bird, Southair; Pat Scotter, Rangiora Aircarft Engineering; Southern Waterblasting; Steve Noad, Aircraft Logistics.

As the saying goes: "You don't own an aeroplane, you just take care of it for the next generation."

In 2019, Emma (ZK-CJE) met Acro (ZK-CAW), leading Bernice to write a new 'Emma' children's book, illustrated by Les Worsley. She notes that, every fairytale having an element of truth, Emma's Special Friend *is loosely based on Pam Collings' Pitts Special ZK-PAC (now ZK-PUG), with nods to other pilots and engineers: Miles Morris-Grange, an MG car (Keith Trillo), Auster Austere Arthur (Greg MacDonald) and a Woody Pusher (Alan and Evan Belworthy). 'Emma's Special Friend' and other Emma books are available from Bernice Hintz at ZKCJEmma@gmail.com*

Haast ticks all the boxes

By Ian Sinclair

Haast River and (inset) township.

The South Westland settlement of Haast is a decent distance from other major West Coast, Mackenzie and Central Otago towns, with good-sized mountains separating Haast from the interior of the South Island.

The town's location, west of the mountains, gives rise to its high rainfall (1.95m per annum). Not quite as extreme as Milford (6.8m pa) but still a respectable bit of wet. Don't be fooled into thinking it rains all the time; it does not. But when it does rain, it does not muck about.

Haast has a small permanent population, many of whom are employed catering for visitors. Haast airfield is 22ft above msl, and the western end of the runway is 1km from the coast.

Preparation

The most rewarding weather pattern for a first visit to Haast is a humongous high pressure system with forecast light winds and a clear sky. The 'perfect' day lets you enjoy the beautiful views that are out every window, and provides a great opportunity to place all the varied terrain into perspective.

You'll be travelling beside or over some spectacular mountains. The wider region is a popular tourist destination, with multiple operators offering scenic flights. You need to be fully prepared and to understand the MBZs or CFZs that exist to support these operations. Make sure you have current information and get a briefing from someone familiar with the area. Generally local operators take fairly direct routes to their destinations, but be prepared, allow generous space from busy areas, follow recommended procedures and keep a good lookout. CAA has some excellent resources to help.

By definition, going to Haast is mountain flying. If mountain flying is not a strong point, a pre-visit refresher on mountain flying may be a good investment.

Haast has cell coverage around the airport and village, and it is fairly reasonable further north up the West Coast. Coverage in Fiordland does not exist. If you use devices with internet-accessed maps, you are best to download them onto your device before heading to Haast. Survival and water safety equipment is required.

Are we there yet?

Yip. Haast Airfield, NZHT, is an all-weather, gravel surface, 700m runway with ample gravel areas to tie down. Take care taxiing; there are some ditches and other obstacles. If you choose to go off the gravel, the grass can be long, wet and soft. There is an RD Petroleum Avgas pump and Jet A1 pump on site. Make sure you have an RDP card or BP card that works with RDP. You can find information by the fuel pumps about landing fees. Johnston Motors Haast is a very short walk (280m) for those who need automotive fuel or treats.

The airfield is close to the Heartland Haast Hotel (350m) and the Haast River Motel (1km). Haast Beach Motel is 4.3km away, while the main part of the Haast township is 2.8km upstream. The

township has more accommodation choices; accommodation providers can sometimes help with transport needs.

Now what?

There is plenty to do in Haast, which lies within the Te Waipounamu – South West New Zealand World Heritage Area. The DOC Awarua/Haast Visitor Centre is well worth a visit.

There are walks in the vicinity to suit all levels of fitness. If you enjoy getting out and about, bring your walking kit or your bike. You may never want to leave. Haast River Safari (www.haastriver.co.nz) operates jet boats on the Haast River.

Haast offers a choice of places to eat: The Spiker Cafe, The Hard Antler or The Frontier Cafe and Bar. The Craypot at Jackson Bay is a popular and unique place to dine but is a 50km drive.

You might also choose to link in other aeroplane accessible destinations. Depending on your plans, a snack at Fox Glacier often works; it's a short walk to town from the airport. At Hokitika airport you'll find the Runway Café. Wanaka or Omaramu often link well as an overnight, cuppa or comfort stop. Both have cafés on the field.

Clockwise from top left: Well maintained walks allow you to explore the local ecosystems; the grounds of the excellent DOC Awarua/Haast Visitor Centre; Ship Cove Dune walk; Haast Hotel is a mere 350m stroll from the airfield.

Milford Sound, on the right day and with a full briefing, will leave you speechless, while if you need more doof doof in your life, a visit to Queenstown may be in order.

In all cases prepare for the destination before you travel by reviewing the VFG and maps. Note that you need a briefing from a current pilot for Milford. Check that the cafés are open before setting off, as some are seasonal or are limited days.

Conclusion

Accessible by aeroplane – check.
Bucket list experience – check.
Fun and interesting – check.
Need to return for a second visit – check.

Carlton Campbell

By Ross Millichamp

Carlton Campbell is well known among South Island aviators. If you live in the south, chances are you've trained with him, been assessed by him, or met him at an aviation event.

Carlton's first taste of aviation came in 1970 through the Scout movement, when he was a participant the Walsh Memorial Scout Flying School's fourth two-week summer camp at Matamata. The school's aim is to prepare scouts through to their first solo. Carlton's parents subsidised completion of his PPL training at the Mid Canterbury Aero Club in Ashburton and, just after his seventeenth birthday, he passed his flight test in a Piper Cherokee 140 out of Christchurch with John Goddard. Carlton remembers selecting the busy road between the Bromley Sewage Ponds as his emergency strip during the Forced Landing Without Power exercise. John thought he would head to the beach but Carlton was focused on the road within clear gliding distance. Cutting the power over a major city during a PPL flight test seems tough by today's standards, but Carlton's training was up to the challenge.

Carlton's PPL training cost a grand total of $450, which seems like a modest amount today, but he recalls that it was a struggle for his parents, and remains grateful that they allowed him to pursue his passion.

As is often the case with pilots who achieve their PPL very young, Carlton did little flying over the following years, being busy attending Teacher's College, marrying and starting a family, and beginning his teaching career. In those days, pilots had to complete six hours flying each year in order to stay current and qualify for a PPL Renewal Flight Test. At one point Carlton was on the verge of giving up because he was well short of this requirement and couldn't afford to do anything about it. At the time he had a summer holiday job on a North Canterbury farm and confided his decision to the farmer, John Sheppard. Believing it a mistake, John refused to give Carlton his next pay cheque unless he agreed to use it to get current and complete the renewal flight test.

A few years later, another North Canterbury farmer played a pivotal role in Carlton's aviation career. While sharing an afternoon's flying with Robin Nicholls, conversation ranged over what each would do if they won the lottery. Carlton declared that he would get a CPL. A few months later, having relocating to Southland for a Principal's role at Garston School, Carlton returned from a school trip to Doubtful Sound to find a mystery envelope on the kitchen table. Inside was a cheque for $2000 and a note from Robin and his wife Carol, advising that they had come into a little money and wanted Carlton to complete his CPL.

He did so at the Wakatipu Aero Club in 1985 and, with 269 hours total time, was immediately hired back as a part-time commercial pilot. In fact, after arriving back in Queenstown from the flight test in Invercargill, he called the CFI to advise that some people were at the Club enquiring about going to Milford, given the great evening weather. The CFI asked how he'd got on with the flight test.

"I passed," Carlton said.

"Good," the CFI replied. "I'm working in town tonight. You better do it."

Carlton used his first earnings as a

commercial pilot to pay Robin and Carol back in full for their kindness.

Commuting between his teaching job in Garston and his part-time flying gig in Queenstown had its challenges, so when a teaching position came up at Wakatipu High School, Carlton leapt at it. Over the next few years he got his C and B Cat Instructor ratings and, in 1988, became manager and CFI of the Wakatipu Aero Club. Under his watch over the next 16 years, the club grew from a small organisation struggling to afford its two aircraft, to a very successful business with five owned and four leased aircraft in its fleet.

Here Carlton also developed a reputation for teaching pilots the art of mountain flying, at the time not covered in the PPL or CPL syllabuses. Whenever the club employed a pilot who had trained outside the Southern Lakes area, they were required to do a fifty hour mountain flying training programme, including landings on farm strips and beaches, before they were considered ready for flight training or charter work. At the time Carlton was very much hands-on, doing between 600-800 hours of flying each year.

Eventually his reputation for safe operations in a hazardous environment was noticed. CAA Director John Jones approached Carlton in the early 2000s, seeking his help to address a spate of mountain flying accidents. In the preceding 15 years there had been 29 fatalities that the Coroners Court and Transport Accident Investigation Commission concluded were attributable to a lack of mountain flying training and experience.

As a solo parent with a teenager in high school, Carlton was reluctant to relocate, but a deal was struck and, when his son finished school, Carlton moved to Wellington to work for the regulator in the Personnel Licensing Unit. It's ironic that Carlton's significant contribution to addressing the lack of mountain flying skills among GA pilots took place in Wellington, many miles from the mountains he loved.

In order to 'examine the examiners', Carlton needed an A Cat Instructor rating, which he completed in 2005.

In Wellington he was involved in developing the PPL and CPL mountain flying syllabuses, and the requirements for Part 135 operators in alpine areas. Teaching the teachers how to teach was another priority for Carlton, who understood that there is more to being a good instructor than being a good pilot. He was tasked with developing the four-day Instructional Techniques Course, used today for improving the effectiveness of flight instruction, and undertaking a regular syllabus review programme for all licences. The CAA AvKiwi seminars, delivered to pilots around the country, was another highlight, as were the regular Instructor, Examiner and CFI workshops and seminars.

Left: Carlton's "favourite office". Above: Having got his own start in flying at the Walsh Memorial Scout Flying School, Carlton enjoys returning as an instructor.

In 2015 the role of South Island Aviation Safety Adviser came up, allowing Carlton to return to Queenstown. He now acts as a liaison between CAA and operators, which still involves a surprising amount of time in the air. The day we met he had just come from a flight with an instructor seeking the requirement for mountain flying instructor privileges.

Together with his colleagues, Carlton is currently focussed on addressing an increase in overhead join and runway landing/excursion incidents. These 'blips' often indicate slippage in training and checking standards, so they tend to work with training organisations rather than individuals. CAA's safety advisors still have time for pilots, however, and are often the first point of contact when incidents or accidents have occurred.

Carlton believes that the 'COVID hangover' has been a contributor to what he sees as a decline in basic airmanship in recent years. Pilots distracted by the chaos caused by covid in other areas of their lives can be less focussed on what is happening in the cockpit, resulting in them not being 'ahead of the aircraft'.

Carlton owns a distinctive yellow and blue 1962 Champion Citabria tailwheel aircraft which is hangared on a private airstrip near Queenstown. He is a regular attendee at aviation events such as AOPA Fly-ins and the Healthy Bastards Bush Pilot Champs. He also acts as a judge at the NZ Association of Women in Aviation Rally and Flying NZ competitions, and has regularly returned to instruct at the Walsh Memorial Scout Flying School. Because he has retained his CPL and relevant medicals, he is able to use his aircraft to travel for CAA work when it proves time efficient. He is a firm believer that you need to 'walk the walk in order to talk the talk', and that being an active aviator helps maintain credibility in the GA community.

I asked about the difficulties of sustaining friendships in the aviation community while being a representative of the regulator. Carlton describes the GA sector as a giant club where everyone seems to know everyone else, and notes that he often has to let an upset client blow off steam for a while before getting on with solving the problem or issue. The most difficult part of the job, he finds, is failing people on assessments, knowing that it could be fatal to their careers. However he is clear that the public of New Zealand have high expectations when it comes to aviation safety, and that the buck often stops with him and his colleagues. Most often, though, an 'aviation related concern' can be resolved by a telephone call, a personal visit or a flying assessment of the pilot concerned.

Looking back on his career, Carlton believes that his time as a teacher prepared him well for his career as an instructor, examiner and safety adviser. The big change was moving from challenging thirty unmotivated people at once, to working with one very motivated person at a time. However the basic strategies remain the same.