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-Stéphane Ledermann, Founder & President, Smart Air
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Regulars

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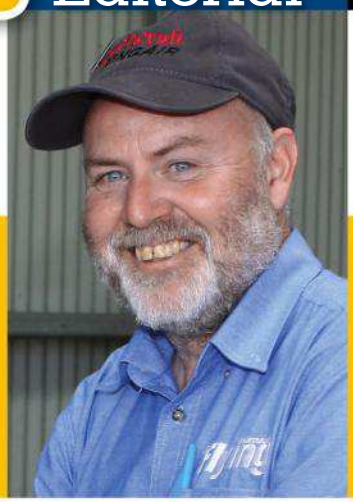

It's not a good strategy for an aviation magazine to sit back and pontificate to the masses. If it wants to be relevant it has to listen, learn and connect at a very deep level. At Australian Flying *we know that, and it's why we value all feedback whether it be a brickbat or a bouquet.*

The Sum of all Feedback

What you are about to read, and what you are about to see, is the sum of many people. It contains the work of pilots, writers, photographers, artists, flying schools, aviation companies, software companies and so many other that make up the whole that is *Australian Flying*.

I just get to be the face of it, which is a privilege that continues to be humbling.

As a result of this salad bowl of opinions, skills, styles and perspectives, this magazine is a reflection of the aviation community in which we exist. Every aspect of that community can be found in the pages of this magazine, even the wrong bits or the bad bits.

And it is all completely intentional; *Australian Flying* was founded to be a general aviation magazine, and though it may be a no-brainer to say so, we have general aviation in our DNA.

One of the tools we use to keep the title relevant is listening. Nobody knows the general aviation community better than those who weekly walk the taxiways of Australia, fly the airways of Australia and love what they do every hour they are awake, and some of the hours that they aren't awake. We rely on that channel to the grass roots to keep ourselves connected to the everyday things, the extraordinary things and the extraordinary people who we exist for.

So you can image how valuable feedback is to us. I regularly find people tugging on my shirt tails at dusty isolated airfields or in overcrowded hangars wanting to ask me my thoughts or give me theirs. In doing so, the binds between the magazine and the community get stronger and stronger.

Are we achieving that? We recently held an on-line reader survey that collected comments from those who took part. In almost equal measures were the opinions that "you spend too much time slamming CASA" and "you don't spend enough time slamming CASA". If this was a key performance indicator of balance, you'd have to mark it with a big tick, wouldn't you?

So you can see the direct nexus between the feedback we get from the aviation community and the product that you are holding in your hands right now. It is the sum of what the aviation community worries about, laughs about, needs to know and wants to know. If you are happy about where *Australian Flying* is at, maybe the person you should be patting on the back is yourself. It's your feedback in terms of conversations, e-mails and website comments that maintains the quality of this publication.

> « you'll find opinion and counter-opinion are given equal weight »

And often, after having a good, healthy conversation with someone about a controversial topic or a matter of airmanship, or the colour of the upholstery in an Airvan 8, I get told "we love your balance."

No feedback about my own work is ever so pleasing as this. I believe that if *Australian Flying* is to reflect the general aviation community then it must reflect *all* of it. In editorials such as this one, or in the weekly Last Minute Hitch, I may sound off like a Sergeant-Major over something or the other, but in the news items and feature articles that make up the bulk of this magazine, you'll find opinion and counter-opinion are given equal weight.

At least that's what we aim for.

Please don't ever stop.

May your gauges always be in the green,

Steve Hitchen – Editor

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Got something to get off your chest? Australian Flying welcomes your input. Send your AirMail, with your name and contacts (which can be withheld from publishing upon request) to: stevehitchen@yaffa.com.au or write to: Australian Flying, GPO Box 606 Sydney NSW 2001.

Editor's Pick

The new PPL medical options were laid out in *Australian Flying* March-April 2018

Commercial Overkill?

The new Basic Class 2 medical uses the commercial driver's licence standard, which in the case of this reader is actually more stringent than the CASA Class 2 standard. This could be an unintended consequence that CASA will have to address.

Steve,
Last week I took an early bite of the Basic Class 2 Medical cherry (commerical driver's licence) … and it's a lemon! It certainly left a sour taste for me.

Trust CASA to not do what all the other countries have done: Private Drivers Licence Medical for Private Pilots. Is it so hard and Australia so unique? Is the "risk assessment" so dire and the "safety case" (if they bothered to do either) so great that Oz aviators have to be so impeded?

I certainly have no beef as a 75+ oldie having to do an annual medical to stay on the roads.
It's a very dangerous place out there; lights, lines, hurtling semis, crawling caravans, signs and motor bikes coming at you every which way, and all at the same flight level! Flying is much simpler and certainly less stressful by comparison.

My AvMed Class 2 has never been a problem, with a PPL since 1959, but I let it lapse a couple of years ago. Since my DL was up for renewal and the medical, I figured I might as well go for the commercial DL medical, in anticipation that this "brave new way" might happen soon.

Armed with the AustRoads medical checklist I went through the process … and failed! Thus I cannot drive a bus or an interstate semi-trailer.

My hearing disability of a dud left ear has allowed me a PPL forever and a private DL, but with this CDML medical, not!

I don't want to drive commercially, I only wish to fly privately, SE, VFR.

So I do wonder for all the other flying folk out there, who may have minor problems with or without the AvMed Class 2, the Basic Class 2 based on the commercial driver's licence medical is probably of no use whatsoever.
Richard Rudd

Courtesy of AvPlan

Richard wins a one-year VFR subscription to AvPlan for our editor's pick! To be in the running to win the same prize and have your views published on this page, submit your letter to the editor now! See e-mail and postal addresses at the top of this page.

Let GPS show the Way

Dear Steve,
Thanks for your article "So you Reckon Dead Reckoning's Dead" in Jan-Feb 2018 *Australian Flying*. It was great to be refreshed on an important safety topic and also to re-consider the balance between the use of GPS and dead reckoning.

I particularly liked that you felt that the flying instructor was "adamant that dead reckoning still has a place in general aviation despite the rapid proliferation of technology" and that the instructor actually said "We still need dead reckoning for redundancy". This is precisely my view as well.

But then, as the song says "and then I (*you* in this case) went and spoiled it all" by stating "You can use a GPS course as an aid to visual navigation, but never as the primary method." I know that this remains the CASA line, but do you still really believe that!? I think that the GPS should be the primary method and that dead reckoning should be one of the applied/available redundancies, i.e., one of the back-ups.

I find the use of the GPS complete with aeronautical charts and so many features for planning and flying (still growing in number) on my iPad enormously increases my situational awareness, navigation accuracy, safety and confidence; "eyes out of the cockpit" etcetera. Although an engineer and lover of maths, I find having to do even simple arithmetic while flying to be quite onerous. In many flat Australian landscapes I find matching position on a paper map to what's on the ground can be quite challenging. The GPS takes care of all that and so much more. So for me the iPad is my primary source of flight planning and navigating. I would not fly without it.

But don't get me wrong – I am extremely safety conscious and concerned about electronic systems failing, so I have many redundancies/back-ups. I fly with two iPads and a spare battery, marked-up paper charts (with planned route, key locations, frequency change points) and a complete paper print out of my flight plan and relevant airport charts. My printed flight plan has space on the RHS for all my planning notes and logged times while flying. Through regular CLEAROF checks I know exactly where I am at any moment on the iPad and on the paper chart. I even still practice dead reckoning on my simulator! But when flying, the iPad/GPS is my primary tool. I have other more minor back-up techniques as well but won't go into them now.

Actually, I think it is well and truly time for the CASA PPL and RPL training syllabus to maybe reduce the time spent on dead reckoning (but still keep it in there!) and introduce the *proper* use of GPS and associated electronic planning and flying tools.
Cheers
Frank Martinelli

Where are all the Gyros?

Why are there no articles on Gyrocopters in *Australian Flying*? I do not mean every issue, but not even one?
Kind Regards,
Ian

G'day, Ian.
The reason why we don't have gyrocopter articles in Australian Flying *is because we don't deal with any aircraft that has an MTOW less than 544 kg. Most gyros are below this. The Cavalon, for example, has a 500 kg MTOW. We don't go below that mark because titles like* Sport Pilot *do it so much better than us; they have the experts and the following. I won't rule it out permanently, but whilst* Sport Pilot *does "ultralight" so well, I'm not sure there is a need for us to make a foray into that segment. The same goes for powered hang gliders, powerchutes and trikes.*

Thanks for your comments,
Hitch

Where's Archerfield?

Dear Steve
I always enjoy reading Shelley Ross' tales of her adventures crossing Australia in light aircraft and her latest, One Tower at a Time [*Australian Flying* March-April 2018], was no exception. Another well crafted story with a strong aviation educational message!

I'm always a little surprised about the number of people who avoid controlled airspace whenever possible. Once you understand it, it is just so easy!

> **I find having to do even simple arithmetic while flying to be quite onerous.**

Okay, I may be a bit biased; being based at Canberra, I encounter controlled airspace (and ground) as soon as you want to taxi! So perhaps I'm more used to it!

I do have one teeny weeny thing to draw to your attention: the mud map on page 18 appears to have transposed Archerfield and Amberley.

I understand this is pretty easy as they share many common features: they're both airports, their name starts with A, they're in southern Queensland and they have control towers. Sure, the runways at Amberley are a wee bit longer and the aircraft flying there may be somewhat faster and definitely noisier, but that's not too much difference is it? I suspect the reception committee on the ground might be a bit more tense if you landed at Amberley expecting Archerfield!

Anyway, I thought it would be useful to point out the transposition lest anyone attempted to use the map as their go-to guide!

More seriously, keep up the good work on GA advocacy. GA is in dire straits and I see little or no interest in Canberra on the matter. Ah, for the days of the CAA!
Cheers
Julian Yates

Julian,
I'll wear this. Shelley did point out to me that there was a potential to have these reversed when we sent the map to the art department, but I forgot to check it. If anything can go wrong, it will go wrong ... and it did.
Cheers,
Hitch

News

STRATEGIC ALLIANCE
PG 12

Who is best positioned to represent the interests of general aviation?

New Strategic Alliance in Canberra

Three major general aviation associations formed the Australian General Aviation Alliance (AGAA) last February in order to provide what they say is better representation of GA interests in Canberra.

AGAA's founding members are AOPA Australia (AOPA), Sport Aircraft Association of Australia (SAAA) and the Aviation Maintenance Repair and Overhaul Business Association (AMROBA).

AOPA CEO Ben Morgan said that the intent of AGAA is to strengthen the position of GA in Canberra.

"Each of our Alliance members have identified the value of working together to build unity and consensus on our industry's most important issues, ensuring that general aviation speaks with a clear voice, whilst recognising the importance of each association's individual identity and membership," he said.

"Standing together, our Alliance will tackle the complex and difficult regulatory issues and is committed to the goal of achieving general aviation revitalisation through joint industry promotion, air shows and events, youth engagement, safety awareness and advocacy."

Both AOPA and AMROBA have been members of The Australian Aviation Associations Forum (TAAAF) in recent years, but over the past year have found themselves at odds with TAAAF policy, particularly when it comes to the issue of 457 visas for pilots. There has also been some discontent over the perceived power of the Regional Aviation Association of Australia (RAAA) and the Aerial Application Association of Australia (AAAA) within TAAAF.

TAAAF Chairman Greg Russell told *Australian Flying* that he was disappointed in the AGAA announcement, but felt the move would not weaken TAAAF's influence in Canberra.

"We really have been making some progress through TAAAF and our relationships not just with CASA, but with the department and I'm confident that will continue. We've broadened the number of associations that have been interested in what we've been doing over the past 12 months.

"I've been around the industry long enough to know that people have their own agendas and if they feel they can be better represented through this association [AGAA], well that's the way life is."

> « we need a very clear voice in order to be understood. »

AMROBA joined the new alliance because it felt the issues of Australia's aircraft maintenance industry were not well represented.

Russell was very quick to dampen suggestions that regional and agricultural aviation sectors had too much influence on TAAAF policy.

"We reject that absolutely. I'm coming up for three years in this role now, and I've always found the TAAAF meetings largely to be collegiate and people's views are normally taken in to account. There are some times when we can't form one opinion because of separate views, but there's been no evidence of that sort of thing [undue influence] whilst I've been in the chair, and I wouldn't anticipate it."

Morgan is adamant that there was a need for a separate association to make sure the voice of the smaller GA companies was not lost amongst a TAAAF focus on the more robust commercial operations.

"When you actually sit down and think about it, who is really representing general aviation businesses; maintenance companies, flying training schools and private pilots? A lot of the feedback we're receiving is that

INDEPENDENT INSTRUCTORS PG 14
GREAT AIR RACE PG 16
AVIATEX PG 18

Australia's home-build association, the SAAA, is a founding member of AGAA.

generally, there is no real representation for GA," he said

"The genesis of AGAA is first and foremost to create a powerful central voice for general aviation concerns, but its true purpose is not just to be an advocacy panel, it's also a forum in which we sit down and say 'how can we work on activities, events and strategies that can actually take responsibility for generating revitalisation ourselves.

"I think it [AGAA] sends a message. It really clearly communicates to government that the issues our industry has are specific to our sector and we need a very clear voice in order to be understood."

Morgan stressed to *Australian Flying* that AGAA would be more than just a lobby group; it would also be a vehicle for driving change from within GA.

"I'm confident that AGAA will play a vital role and be a major catalyst for creating growth and opportunity. Advocacy is great, but what's even better is producing a strategy and a plan that the ordinary members of the general aviation community can get out there and make happen.

"What's important is that we start harnessing the desire from the thousands of people in the industry and actually come up with a strategy to succeed.

"You can continue to throw topics backwards and forwards, but until you can go out there and start solving membership issues for aero clubs, reducing the cost and impost of flight training approvals to get businesses into the industry, you're not going to make a dent."

In the past, the three AGAA members were all represented on CASA's Aviation Safety Advisory Panel (ASAP) courtesy of their TAAAF membership, but now are likely to seek a separate seat for AGAA.

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The Case for Independent Instructors

Independent flying instructors ceased to exist in 1989, which several industry commentators blame for the decrease in GA activity.

Thirty years ago a flying instructor could set themselves up as their own business, teach where they liked and who they liked. Free of the need for operations manual, safety management systems and audits, the independent instructor could lob at a small aero club and conduct lessons for a fraction of the cost that flying schools charge today.

It meant a student could go to a local airport and start flying lessons almost immediately. Today, so many small schools and aero clubs have folded under the weight of maintaining an AOC, that students don't have local options anymore.

But it seems now there is a push on to return to the days when independent instructors were common. In particular, the Aircraft Owners and Pilots Association of Australia (AOPA) and the Aviation Maintenance Repair and Overhaul Business Association (AMROBA) have been very vocal in their calls to return to independent instructors

However, the issue seems to have escaped from both the Aviation Safety Regulation Review (ASRR) and the BITRE GA Study, which has disappointed proponents.

"The GA study highlighted most of the issues, though they did not trace back to original reasons for decline," AMROBA Executive Director Ken Cannane says.

"When I was in the CAA, we knew in the mid 1990s that the removal of the independent flight instructor in 1988 was the real reason for the decline in pilot training/numbers.

"Until re-introduced, based on the FAR Part 61 model, private flying and flight training will continue to decline. Independents kept alive flying clubs and regional access to flying training.

"They were the heart of GA."

Independent flying instructors are still used in the USA without, it seems, any decline in training standards. On his website, Dan Ramsey, author of *The Frugal Pilot*, points out that there are actually many advantages.

"An independent flight instructor is one who is available for hire outside of a flight school," he says. "The instructor might also work under contract to a school, work as a commercial pilot as well, or have some other type of job. The point is that the flight instructor can be hired by anyone who wants to learn to fly.

"It can be your best option if you have unique circumstances. For example, if you don't have an aircraft of your own you sometimes can train in the instructor's aircraft. There are even gypsy flight instructors who will fly to your location for intensive training in their aircraft. An independent instructor might be practical if you don't live near a flight school or you are looking for non-standard training such as mountain flying or floatplane flying.

"In addition, independent instructors are typically less expensive than hiring a flight school."

AOPA CEO Ben Morgan has taken up the cudgels, and like Cannane, believes much of GA's decline can be traced back to the decision to delete independent flying instructors.

"Every aero club in the country knows that they're stuck in a situation where they cannot provide general aviation training because CASA's made it too expensive," he told *Australian Flying*. "They can't afford the approvals, they can't afford the staff and they can't afford the compliance impost."

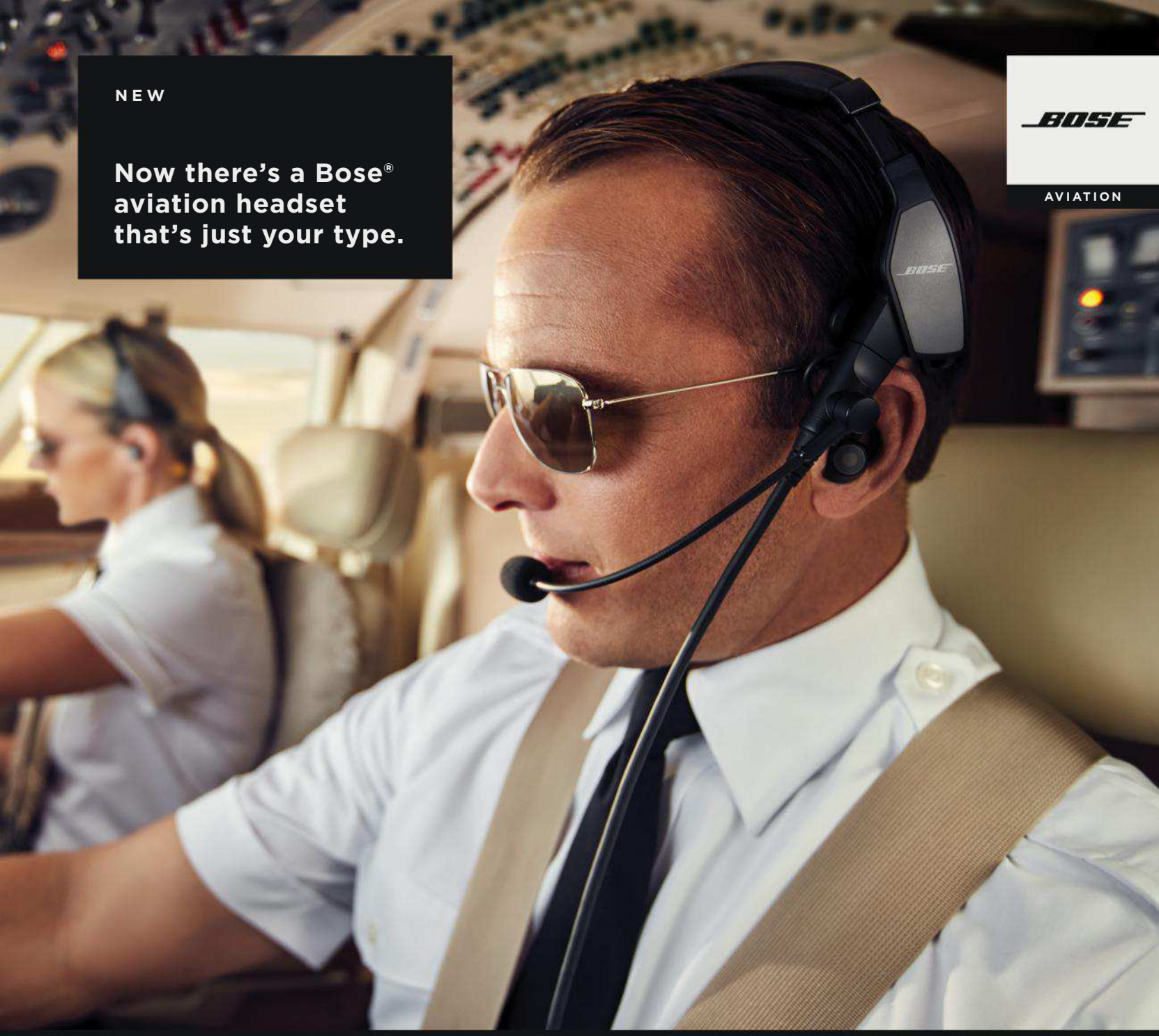
When asked, a CASA spokesperson responded that under the Part 141, indepdendent flying instructors could apply for a Part 141 certificate.

"The concept of independent flight instructors was raised with industry over a number of years during the consultation process of CASR Parts 141 and 142 and was not progressed," the spokesperson said.

"The intent of maintaining flying training under a Part 141 certificate or Part 142 air operators certificate is to ensure our flying schools operate under a framework designed to provide consistency with training standards and therefore safety.

"Individuals are able to operate their own flying school and obtain a Part 141 certificate, in fact we are aware that a number of instructors have already made the transition. The process has never been easier as CASA provides free of charge, a sample operations manual and training syllabus on line which the individual only needs to fill in their own details and apply."

Flight training today is not cheap, and many in the industry blame the decline in independent instructors.



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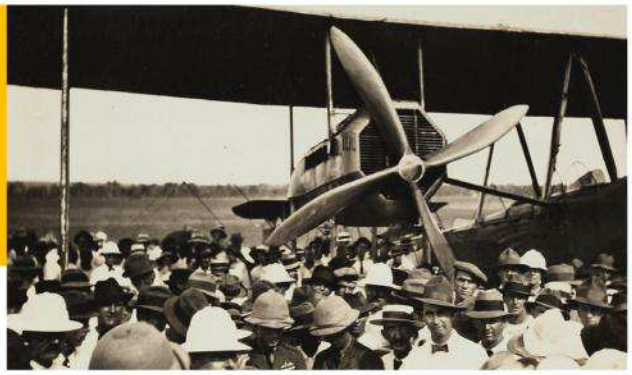

LIBRARY OF NSW

ABOVE: A crowd gathers around the winning Vickers Vimy of Keith and Ross Smith.

An air race from London to Darwin has been planned for 2019 to celebrate the centenary of the 1919 Great Air Race, using only aircraft powered by electricity.

In 1919, the Australian Government offered a £10,000 prize for the first plane, crewed by Australians, to successfully make the journey from London to Darwin in fewer than 30 days. Brothers Ross and Keith Smith, flying modified Vickers Vimy G-EAOU, won the prize when they landed in Darwin after 27 days and 20 hours.

The 2019 event is expected to attract competitors from around the world, and is planned for September next year. The event has the support of the Northern Territory government.

"By showcasing low pollution, electrically-powered and innovative, highly efficient aircraft in the Great Air Race, we aim to celebrate a century of achievement by engineers, designers, and aircraft constructors," an organiser's statement says. "We will together usher in the next century of quiet, environmentally friendly aviation."

Professor John Storey, Emeritus Professor of Physics at UNSW said that the centenary race could fast-track renewable flight technology and stimulate the e-aviation industry.

"The event is technically feasible," he said, "but being able to complete the route within 30 days is by no means a foregone conclusion. That makes 2019 the right time to stage it: in 2009 it would have been impossible, in 2029 it will be routine. It's a very happy coincidence."

Aircraft competing will be allowed to re-charged using renewable energy sources such as solar and wind, or by hydrogen fuel cells.

Hybrid aircraft will also be included in the race, with some power coming from batteries and some from an engine.

Entries for the 2019 Centenary Great Air Race opened on 19 March, 99 years to the day that acting Prime Minister William Watt announced the original London-Darwin race.

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Aviatex moves to Bankstown

Bright Events makes strategic move to Sydney.

Aviatex 2017 at Illawarra Regional Airport

General aviation exhibition Aviatex will relocate from Illawarra Regional Airport to Bankstown Airport this November after a partnership deal was arranged between organisers Bright Events and Sydney Metro Airports.

Aviatex has in the past been held in conjunction with Wings over Illawarra at Albion Park.

According to Bright Events, the move is a strategic one to place Aviatex in the heart of Australia's largest city, which it believes will give greater scope to take in the education and training sectors covering all areas of the aviation industry.

CEO of Sydney Metro Airports, Lee de Winton, welcomed the move as one that would help showcase Bankstown not only to the aviation community, but also the general public.

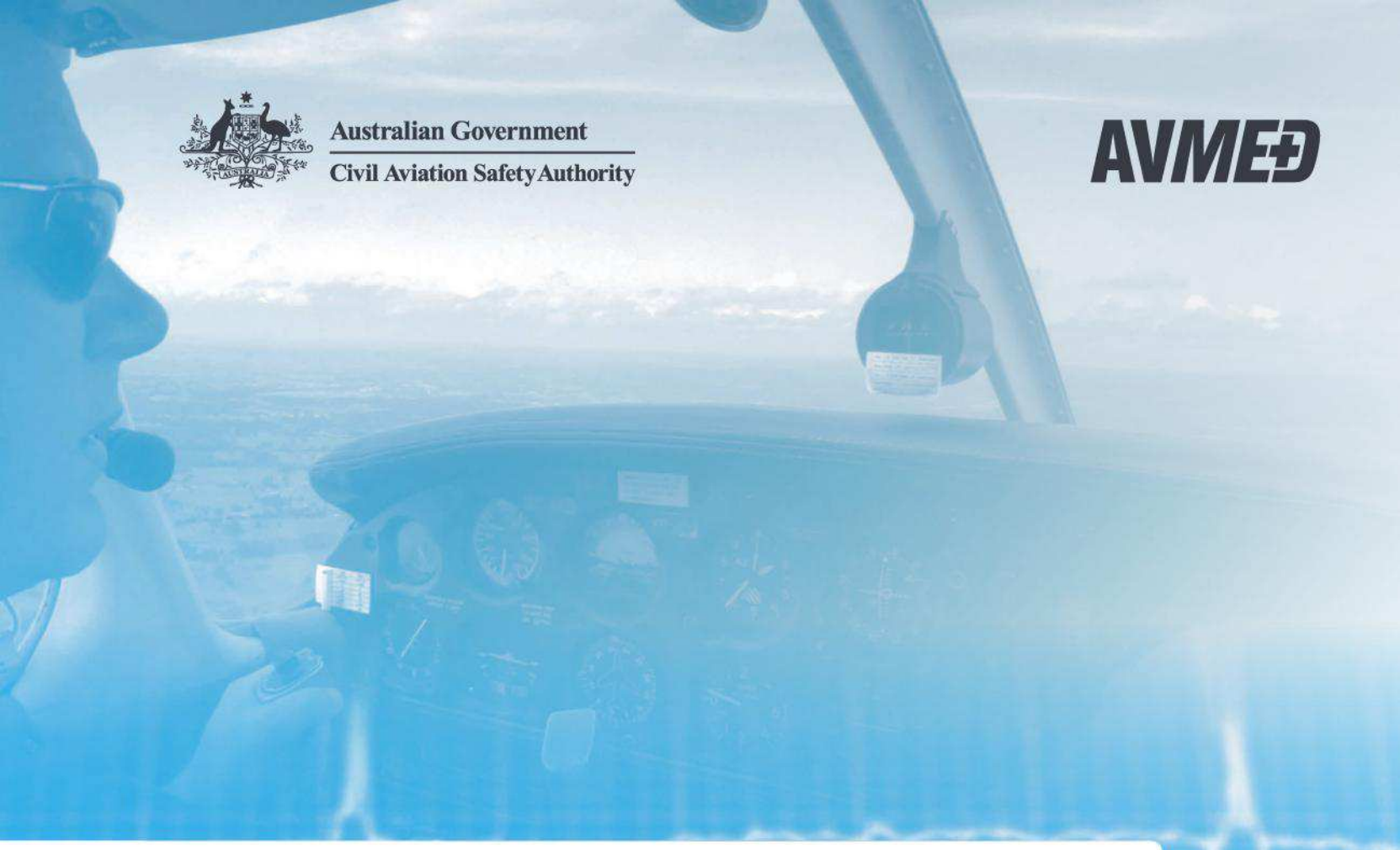
"This is an exciting time for our airports, general aviation in the Sydney Basin area and also the community," she said. "I am pleased to welcome Aviatex to Bankstown in 2018 especially as we need to attract the next generation of pilots, engineers and other aviation professional to meet the needs of both the imminent Western Sydney Airport and the wider Australian aviation industry."

Bright Events is hoping to specifically attract school leavers to Aviatex to sample the range of potential career streams on offer, ranging from flight training to engineering, management, air traffic control, general aviation and aviaton both civil and military.

"We are excited to provide the general aviation community a platform to showcase their products and services in such a prime location," said Bright Events Director Mark Bright.

"We encourage the aviation industry to take advantage of this opportunity to engage with other industry professionals and career seekers. The expo will also provide an outstanding venue for business leaders to network, with specific areas set aside for seminars and private conferencing."

This year's event will be held over three days 15-17 November and is open to the general public. General admission tickets are $10 for adults, $5 for students, and can be bought on-line or at the gate.



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For more information about the new basic class 2 and other changes to medicals, go to the licences and certification/aviation medicine section of **casa.gov.au**

In the Heart of the

Welcome to Corynnia Station, the surprise oasis on NSW's expansive Hay Plains.

Plains

CORYNNIA STATION

With plenty of other airstrips and stations in this part of NSW, Corynnia is often included in gliding safaris.

CORYNNIA STATION

Any closer to the accommodation and you'd be landing on your bed. Grab that diary and cross off a couple of days to immerse yourself in a slice of NSW's best sheep and cotton country. **Shelley Ross** reports from Corynnia Station.

t's all about the jungle drums. Imagine how many places and faces we'd miss out on if we didn't all love passing on the good oil about a great experience we've just had. Word-of-mouth – Australians are masters at it.

I'd heard from Barb at Bindara and Toni at Kilcowera Station that another Outback Beds member, Corynnia Station, the home of Bruce and Julie Armstrong, was well worth a visit. So I did a bit of homework a while ago and liked what I found. I then had long chats with Julie who, amongst a million other duties, runs the "people" side of things out here, looking after their ever-growing tourism business. If her energy and enthusiasm over the phone reflected her usual disposition, I was very much looking forward to meeting this lady.

Corynnia (corynniastation.com.au) lies between Hay and Griffith on the Hay plains of southern NSW, which has the dubious reputation of being one of the flattest places on earth. The reality is the fall of the land out here is 1 cm per kilometre. Well, I figured, we're pilots ... flat is good. It's also a very achievable same-day destination from Sydney; indeed from about five other capitals as well. So I rang Curtis Aviation and booked my favourite C182 for a mini adventure. It wasn't hard to muster up a posse to join Rossy and me. "You'll love it," I told them. "The airstrip's right next to your bed!" I had to laugh when one of the blokes reminded me he's not that good at staying on the centreline when he's landing.

"She should be proud of her work; it does indeed have the feel of a sanctuary."

CORYNNIA STATION

Farming class is in

Julie's husband Bruce is minister-in-charge of everything else on the property that bleats, barks or grows, with most of Corynnia's 7000 hectares devoted to their flock of 8000 sheep and substantial grain and cotton production. The Armstrongs are passionate about their technologically advanced farming methods and are keen to spend as much time as possible with guests to tell their story.

Constant work around the property means you will find Bruce a little more elusive than Julie, but if you can catch him, do a farm tour with him. Totally fascinating. We learnt of trees in Corynnia's ancient Black Box swamp that are up to 1000 years old, their wildlife like a tiny bat which is unique to the property, how cotton is grown and harvested, and the pride in producing their high quality Merino wool … you name it, Bruce can talk about it, and loves nothing more than sharing his knowledge about Australian agricultural methods.

Another topic you might have

in common with him is flying! Julie tells me whenever Bruce is up in his C172 on a flight around Corynnia, there's nowhere else he'd rather be. "That's his 'me' time," she says. "He loves his flying. He's so comfortable up there, getting a bird's eye view of where everything on the property is up to. It's his solace."

You're going to love flying into here too, with the iconic view of that big red strip as it appears in your windscreen, visible from miles out. The strip lies right alongside the accommodation and magnificent homestead, surrounded by a completely surprising spread of lush green lawns, tennis court, pool and thriving garden. Something tells you many hands and many hours of constant labour go into keeping the picture looking this good.

Indeed, 97% of that labour was Julie's, solo. Starting with the bare bones of the earth, her dream was to create a place of renewal against the harsh elements of the land surrounding their home. "Through all the years of the unforgiving drought," she says, "I wanted Bruce to have a beautiful environment to come home to at the end of each day." She should be proud of her work; it does indeed have the feel of a sanctuary.

Beds for all

Corynnia has a range of various sized guest cottages, to suit small or large groups calling in by road or by air. It can take up to 22 people total. As we were a group of ten, we fitted nicely into Maxie's Retreat, a new rustic-style six-room lodge about ten paces from your parked aircraft. It has one double bedroom and five twin rooms, so there's your group fly-in logistics sorted right there. Talk to Julie when you book and she'll happily arrange full catering if you want it. Then it's just a matter of choosing the best cook amongst you to be chief of the BBQ. We find it goes down really well to stand nearby with something very cold in our hands and offer helpful advice to the head chef about their technique with the tongs.

CORYNNIA STATION

CLOCKWISE FROM LEFT:

You probably won't have the grounds to yourself as you wander.

I don't think they're flying again til the day after tomorrow.

There's just something special about supervising the sunset with a campfire and a view like this.

Your hosts Bruce and Julie Armstrong will make you feel right at home.

As long as it's dry, Corynnia's strip makes a great welcome mat for visiting pilots.

We had a lay-day here where some of us did a farm tour and Bruce lent the others a vehicle to go for a drive into town. Griffith is only 45 minutes away, if you like the sound of wineries and good restaurants with a regional multi-cultural flavour. But, with so much to take in, the property itself is a wonderful place just for long walks or bike rides.

Refuelling options nearby are Griffith to the east and Hay to the west. If you call into Hay, try to make some time to visit Shear Outback, the Shearers Hall of Fame. It's so well done, a stone's throw from the airport and a great place for lunch or coffee. The one thing to keep in mind is that Corynnia's airstrip is dry weather only. It is unusable after any rain, thanks to a red clay surface, most of which wants to stay firmly glued to your tyres as you apply full power on take-off. Safe to say, don't expect anything encouraging to happen at this point. Luckily it doesn't rain much out here. Mind you, Bruce doesn't quite see it that way.

If you've got a week's leave pass, and you're getting to like the idea of "staying with friends" in the outback, I encourage you to try other stations like Bindara on the Darling, Nelia Gaari, Trilby and Kallara. You'll have an honest Australian stay in the middle of our bush – that's pretty hard to beat.

More photos: flyingtheoutback.com.au

CORYNNIA STATION

Arrested Development

Light sport aircraft have everything a pilot would want nowadays, which begs the question: where to from here? **Steve Hitchen** investigates the state of LSA development and options for the future.

Many in Australia's aviation community still regard Light Sport Aircraft (LSA) with the same snobbishness that a Jaguar owner looks upon a Holden Barina: the lack of power, luxury, utility and prestige is very off-putting. That sentiment prevails despite most LSAs actually being a more technologically-advanced aircraft than many general aviation models on the market.

The LSA category developed with one major advantage over GA aircraft: it was free of the dinosaur constraints of FAR 23, the world's peak standard for aircraft certification. That meant designers could employ new materials, new avionics and new construction methods with abandon; all necessary virtues in a category restricted to a 600 kg maximum take-off weight.

Consequently, the LSA category finds itself in the position of technology leader in the private aircraft market, even if regulations keep designs–and therefore utility value–on a very tight rein. But has LSA development hit a brick wall? Whereas general aviation aircraft have a lot of catching up to do, the path forward for LSAs is not quite so clear. Composite materials are almost the norm, avionics are some of the best available and construction methods are state-of-the-art. So where is there to go?

"I believe the LSA sector has reached an interesting level of maturity," says Dan Johnson, Chairman of the Light Aircraft Manufacturers Association (LAMA). "That is not to say no new innovations will happen, but many of the main developments are now common on most LSAs.

"It's not so different from smartphones that totally upended mobile a decade ago with the iPhone. That industry has also matured and development has perhaps slowed.

"The funny thing about innovation is you often don't know where/when it might emerge. Electric propulsion is one such question mark and then we have whole new aircraft with a collection of spinning blades/props. Who knows where that is headed?"

Sue Woods, Business Manager of Jabiru Aircraft points out the LSA designers are under pressure from customers to fit more into the very tight parameters of the category.

"The biggest challenge for aircraft manufacturers is to keep the weight down while constantly being pressured by consumers to include all the add-ons of heavier aircraft," she says. "Pilots and passengers keep getting heavier too. Consumers want all the frills but forget that there is a weight cost for every little thing added.

"The easier pilot licensing, medicals and maintenance rules we enjoy in [RAAus-registered] LSA come with a low stall speed, a two-person limit and a 600-kg MTOW, because these design limitations provide an inherent safety factor for the category. Parachutes are usually the add on to get the partner in the relationship to agree to the aircraft purchase or if the aircraft can't pass the spin tests."

MAIN IMAGE: Icon's A5 amphibian may be the most advanced LSA available, so where can development go from here?

LEFT: Dynon's Skyview system now enables LSA cockpits to like more like a Boeing or an Airbus.

Material issues

The LSA industry is not backward in claiming pioneering status when it comes to innovative construction, introducing composite materials that delivered fantastic strength-to-weight properties and a formability

ICON AIRCRAFT

"the newest technology will appear in the least regulated aircraft first."

that went way beyond that of aluminium.

"LSAs promoted use of modern materials," Johnson points out. "Today Boeing's Dreamliner is a current example of high-tech material use. Cirrus is another modern success story. LSAs have been using carbon for years; some have more than 90% of the super-strong, lightweight material.

"Composite means more than one type of material. In the past that has meant plenty of fibreglass. LSAs already involve composites with fibreglass, Kevlar, carbon fibre and metal used. Today, the most advanced designs are carbon fibre, which, yes, is partly for weight, but also strength."

Aircraft types made of composite have become too numerous to make a comprehensive list, but it would include the most familiar names in LSA construction.

Those manufacturers that embraced composite materials propelled the LSA category into the technological lead. Without being hamstrung by FAR 23 rules, the LSA builders were free to use the versatility of composites to produce aircraft that could meet the specifications at a gallop, and that looks set to continue.

"Jabiru has always used composites for the complete structure of the aircraft, except for the wing strut, for 30 years now," says Woods. "We use composites made of fibreglass, epoxy resin and Coremat® which provide an incredibly strong structure.

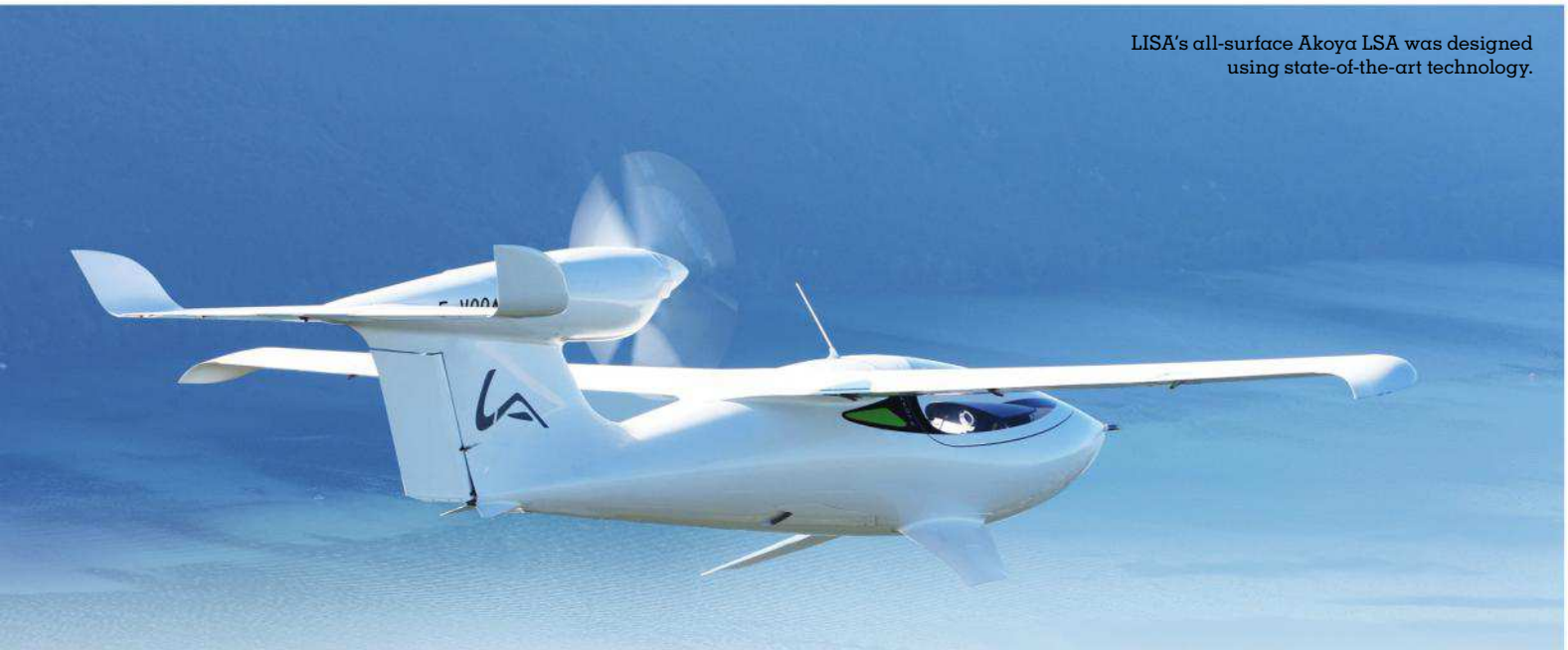
"When Jabiru started, CASA required enormous reserve factors for composite aircraft combined with and incredibly low gross weight of 400 kg. During the development the gross weight was increased to 450 kg combined with a stalling speed of 40 kt in the landing configuration. The reserve factor for composite aircraft was 8.8 g, but only 5.8 g for metal aircraft.

"This was a reflection of the lack of history on composite use at that time. The advantages of composite over metal is the ease of repair and the greatly reduced risk of fire resulting from a spark after an incident. Manufacture is low in capital costs too."

Several LSAs have retained traditional materials in construction, particularly wood, fabric and aluminium; each material has properties that have been proven in aircraft construction over many years. In some cases, the idea is not to be technologically advanced, but to reflect the early, much simpler days of recreational flying that gave the world the J3 Cub, AOP Auster and Tiger Moth.

Metal options

General aviation giant Cessna arrived in the LSA market with clarions at full blast when it announced the C162 Skycatcher in July 2006. When the aircraft made it to market, it confounded several industry commentators with its mainly aluminium construction; only the engine cowl made of composite. When most manufacturers in the class were going composite, Cessna had stuck with a traditional construction that reflected one of their core



LISA's all-surface Akoya LSA was designed using state-of-the-art technology.

LISA AIRCRAFT

competencies: shaping metal.

One manufacturer that has stuck doggedly with metal construction is Australia's Brumby Aircraft. The Cowra manufacturer produces the low-wing Brumby 600 and high-wing Brumby 610, both of which are mainly metal, with some composite parts in non-critical areas. According to Brumby's Paul Goard, metal is for many customers simply a more practical material.

"Very few repair facilities can perform a composite repair," he believes. "Some are competent enough to sign it out, but very few can repair it to manufacturers standards. In this context, composite for flying schools is a major problem.

"We put a composite top on the low wing, and that's because although the top is structural, it can be repaired by any competent person with fibreglass technology.

"A mix-and-match is the way we think we can go. Composite is here to stay, but for us it's going to be more the fairings, the top turtle deck and the undercarriage fairings. It is repairable, but doesn't ground the aeroplane for a long time, and that's a problem for flying schools."

Despite the obvious advantages of composite in the form of strength, low weight and formability, LAMA's Johnson says metal aircraft will be forming part of the LSA fleet for some time yet.

"Metal is clearly here to stay, at least for the foreseeable future," he told *Australian Flying*. "Its advantages in easy repair, easier-to-determine fatigue, and a familiarity with working the material will keep aluminium in play."

It's a sentiment that Paul Goard agrees with, but the man from Cowra sounds a warning about the continued use of metal. Because it is generally heavier than composite, manufacturers have a tough battle to keep the basic empty weight of the aircraft as a level customers will accept. According to Goard, that can lead to some corner-cutting.

"the wheels of change turn very slowly and the standard looks very entrenched as it is"

"The problem with construction on most metal LSAs is that they are built too light. They're OK for a while, until the rivets start working loose and the undercarriage bolts start moving and they become a real problem.

"When LSAs first came out, a school in Sydney bought 10 aircraft and within a year they were all no good because they couldn't take the punishment from the students. The aircraft were also built at 325 kg and they just couldn't stand up. Now we've seen construction change; there's larger undercarriage legs and better carry-through spars among other things on a range of aeroplanes that have beefed them up. They are a lot stronger, but that comes with a weight penalty.

"When they build them light, they fail, so you've got to have a compromise. We don't believe they can build a strong enough LSA under about 375 kg in a metal aeroplane."

Many customers are now loading up LSAs with so many options that basic empty weights are now averaging almost 400 kg. And as the average human being is now weighing more like 83 kg than the 77 set down in the dark ages of aviation, it doesn't take much for the take-off weight to butt up against the 600 kg limit.

The debate about a safe empty weight for an aeroplane is a compelling reason for the ASTM standard to which LSA are made to be revised to include a higher take-off weight, which would remove the pressure from manufacturers to build a safe aeroplane that also has a decent usable load. However, the wheels of change roll slowly and the standard looks very entrenched just as it is.

On the panel

Until Cirrus Aircraft turned the world on its head in the early 2000s by putting an Avidyne system in their SR20, avionics were demarked into two categories: glass cockpits for heavy commercial aircraft and round analogue "steam gauges" for general aviation. Cirrus made sure the twain met, and in doing so pioneered new avionics systems for aircraft of just about any size, and that includes LSAs.

It created an impression that LSAs were starting to look more like airliners and corporate jets because they'd adopted that level of technology in the cockpit, but there are those in the LSA industry that take quite a bit of umbrage at that suggestion.

"In fact the flow of technology is going mainly from LSA to GA these days," Sue Woods points out. "EFIS and engine monitoring have a faster rate of uptake in the LSA sector due to the ease of fitment and manufacturer approvals and price point for this equipment. Anything fitted to a GA aircraft will wear the years of certification

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costs through the authorities that the developers have to recoup.

"Technology manufacturers will often introduce their product to the LSA market first to help fund the certification required for the GA world and gain service history in the process. Jabiru includes EFIS and Engine Monitoring Systems in the base models. There is no option offered to not have this technology any longer. Some steam gauges are used as back-up.

"Never has it been so easy to stay on course with the rapid advances we have seen in user friendly GPS software that go with you when you leave the aircraft. It won't be long until head-up displays (HUD) will be on the LSA scene when the price is right. "

Dan Johnson not only agrees with Jabiru, but also believes that avionics in LSAs actually advanced the cause for general aviation aircraft because of the stress of demand for lighter units that did much more.

"LSAs massively stimulated new instrumentation," he stresses. "From the first GPS use on hang gliders and the first digital engine instruments on ultralights, we now have gorgeous flat screens on LSAs, touch-screen digital devices in full colour with more information than we ever dreamed … and all while most type-certified aircraft are still dominated by round analogue dials.

"Plus this explosion of visual data came at vastly reduced prices. LSAs also encouraged developers of synthetic vision, cheap autopilots, cheap angle-of-attack indicators and more.

"Many airline pilots looking at LSAs say 'Wow, this is as good or better than what I have in my airline cockpit!' For example, synthetic vision has been around for years already in LSAs. Today, EFIS is pretty much standard in all LSAs and, to some extent, that is spreading to type-certified aircraft in the form of iPads that

MIKE RUDD

Aeroprakt developed their A22LS Foxbat into the faster A32 Vixxen.

can now show full ADAHRS [Air Data and Altitude and Heading Reference System] info plus traffic and weather.

"HUD is also coming but at highly affordable prices and who knows what new tech is on the way. AoA has been around for years, too, and commonly the cost to add an AoA is US$200 per aircraft. This is a tiny fraction of the cost on type-certified aircraft. One thing I feel sure of: the newest technology will appear in the least regulated aircraft first."

But having mind-blowing avionics can be, for some pilots, a bit like winning $5 million in the lotto: if you can't handle the windfall it will probably end up handling you.

"With avionics now, everything's glass and they're like computers; they've got everything in them," Paul Goard says. "What people have to realise is that when you go glass, you go glass. You don't go glass and then have a tacho, airspeed indicator and altimeter as separate back-ups. What

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Pipistrel Alphas in production in China. The aircraft has options for both Rotax and electric engines.

you need to do is go for one or the other or you'll pay a weight penalty. Glass-cockpit avionics are also super reliable; the autopilots are very reliable and they all work quite well.

"The trouble with glass is that you get low-time pilots with a plane that has everything in it and they forget to look out the windscreen! A lot of people have all this technology and they forget about flying."

Power play

Like all engine manufacturers, the holy grail of development is the lightest weight engine delivering the most power for the least fuel consumption. But when it comes to power, regulation may be holding back progress. LSAs have two limits that impact engine development: a 120-KTAS maximum speed and a 600-kg MTOW. It has reached the point now where making a more powerful engine is pointless if it can't be used to go faster or carry more. Improvement must therefore com from elsewhere.

Dan Johnson: "Engineers have introduced new concepts in LSA power plants. Engines made by market leader Rotax brought concepts like liquid cooling, geared output, high efficiency; with much smaller displacement engines, Rotax nonetheless produces the same power as an O-200.

"Lighter, smaller packages made aircraft design easier and sleeker. Most recent developments include the electronically-controlled, fuel injected 912iS, iS Sport, and 915 iS engine, which also incorporates a turbo-charger and intercooler. Next: electric propulsion, which will work best on light aircraft like ultralights and LSAs initially."

Fuel efficiency is one area that engine manufacturers can work on. Although the Rotax and Jabiru engines are already fuel-sippers compared to the Continental and Lycomings fitted

to GA aeroplanes, technology and development is likely make them even more miserly for the same power output. However, Paul Goard sounds a gentle warning.

"You can make engines more fuel efficient, but the price goes up," he points out. "The Rotax 912iS will get back to 14-16 lph in the circuit instead of 20 lph, but that comes with a weight penalty. You've got electronic boxes, dual fuel pumps; so every time they design something there's added weight and complication."

The limits

Light Sport Aircraft are very specific animals, created for a very specific purpose to a very specific standard. One opinion in the aviation industry is that it's time for that standard to be reviewed in order to take advantage of new technology that could make LSAs safer and more efficient. Perhaps the regulation under the most pressure is the maximum take-off weight, which many believe could be easily lifted to 750 kg, and still stick to the stall-speed requirements.

"A lot of people have all this technology and they forget about flying."

"Jabiru would welcome the weight limitation being lifted to 750 kg," says Sue Woods," as our J230 will fit right in and would then be allowed to carry the weight it was designed to take. The huge luggage space available would be very useful.

"When Jabiru first entered the market, the standard occupant weight was 77 kg. It is hard to find 77-kg occupants these days. "

Jabiru aircraft leave the Bundaberg factory nowadays carrying EFIS, engine monitoring, GNSS and sometimes even an autopilot. All that adds weight, which has to come out of the useable load. Most times, fuel is left in the bowser to compensate. With an extra 150 kg on the MTOW, extra fuel could be loaded to increase the safety factor.

"Something somewhere in America is going to have to give soon," Goard chips in, "because the technology is overtaking what the basic LSA was set up to do. Originally we didn't have parachutes, we didn't have in-flight adjustable props, we didn't have twin-turbo Rotaxes that are capable of 140 hp. Nothing was beautifully faired back then. If you look at the early Tecnams they had no fairings around struts and things, and now we have all this.

"Somewhere along the line, the ASTM standard for LSAs is going to have to be updated somehow to compensate for this, and there may be restrictions in place.

However, Goard also understands the argument, that LSAs were designed as a simple aircraft to do a simple job and they need to stay that way, not have technology morph them into something more complex.

"We've tried to make them more complicated by adding things to them. Everyone's getting wound up about what you can add to them, but if you go back to what LSAs were supposed to be: light impact, slow stall speed ... that's what they were designed for.

"It's a matter of how far do you go? You've got to have technology because the LSA manufacturers are putting it in everything, and if you don't keep up, your company is behind. There is also the school of thought that we should be keeping them simple, which is what they were designed for, but everyone's going away from that; they're losing the big picture."

Getting out of Town

BITRE states that if operators don't like conditions at the larger GA airports they can always leave. *Australian Flying* sent **Philip Smart** to find out if relocating to smaller airports really is as easy as that.

It's no secret that businesses based on Australian airports are under pressure, as mounting costs force them to revisit their business models and projected revenue in a post-privatisation world.

While the nature of some businesses includes the flexibility to move off-airport, those that depend on bringing aircraft through the front door or bringing people to the tarmac are faced with the option of continuing to absorb rising costs or of moving to smaller airports.

In 2017 the Bureau of Infrastructure, Transport and Regional Economics (BITRE) released its General Aviation Study statistical report. Two case studies gave clarity to the issues.

According to the BITRE report, the Cairns-based North Queensland Aero Club faced a 500% increase in the lease cost for its Cairns Airport headquarters building when the original lease expired in 2014. The club was expected to pay around $5500 per month, plus an additional land tax of $10,000 per year. After accumulating significant debt under the higher rents, the club relocated to Mareeba Airport on the Atherton Tableland in 2015 and now pays around $1500 per month in accommodation cost.

Among the issues of ageing aircraft and regulatory cost in the BITRE report, the subject of operators bearing the cost of necessary airport upgrades and maintenance also came to the fore, with BITRE suggesting that some aircraft operators may choose to relocate if costs at their traditional base are becoming unsustainable.

"Changes to airport operating arrangements at some airports were raised by aircraft operators, given concerns over the impact on charging and lease arrangements," the study stated.

"These concerns are heightened where airport operators strengthen runways to meet the needs of the largest aircraft expected to use the airport. Airport infrastructure needs regular maintenance, regardless of the amount of traffic that uses it; and runway maintenance can be very expensive. Operators of small aircraft that do not need strengthened runways may find it cheaper to relocate to smaller airports nearby."

PHIL HOSKING

Not so easy

While this paragraph may make it sound like relocating is simply a matter of tying down at a different airfield, the reality for aircraft owners and particularly the businesses that support them is a lot more complex.

In the first instance, not everyone has a "smaller airport nearby". For aircraft owners at Bankstown and Camden, Cambridge, Parafield and Jandakot, the nearest suitable airport is in the countryside outside their host cities. In most cases, this makes the aircraft less accessible, and requires operations from an airfield that may be less well equipped than their current home.

But for the aviation-related businesses that support general aviation, the loss of their market and the possible requirement

MAIN IMAGE: Melbourne's Essendon Airport is one of several capital city GA airports that are now privately run.

LEFT: Adelaide flying schools and operators have no viable alternative to Parafield Airport.

that they themselves could move from their traditional homes can mean a fundamental change in their business case and ability to survive.

For flight operations and the maintenance organisations supporting them, moving to smaller airports can mean marked changes in their operating conditions, available services and market catchment areas. It can also result in a loss of economies of scale or of proximity to other supporting companies, the "ecosystem" of mutually supporting businesses that make up a long established community.

Keith Tonkin is managing director of Aviation Projects, an Australian consultancy specialising in design and management of airports, airport operations and airspace. The company has consulted for airport owners, operators, regulators, governments and service providers in Australia and the Asia Pacific, on projects such as airport upgrades, aerodrome safeguarding, master plans, risk management for new and older airports, wind farms, drones and airspace management.

He believes the idea of aviation related businesses relocating to smaller airfields to escape rising costs is a lot more complex than many realise.

"Cost pressures at those airports that are seeking to make an economic return are causing businesses to look elsewhere and some of those businesses have moved to ALAs. But they're causing grief for the ALA operators, because there's increasing intensity of operation or a change in a scope of operations that the owners of the aerodromes aren't necessarily equipped to manage.

"Often they don't have a fees and charges structure, so financially they're attractive. But there are challenges in preparing sites and building hangars and providing the infrastructure and services that these businesses need for a start. So usually they don't have the situation available to construct the facilities that would be needed anyway."

He described a maintenance repair organisation which relocated to a grass field ALA.

"People fly in there from all over the place," he told *Australian Flying*. "But then the challenge is if the aerodrome's wet you can't land on the grass. The access and reliability of the aerodrome is questionable. So some of those things are obstacles to them being a viable alternative.

"And then there's a challenge of managing safety oversight and sometimes increasing intensity. When you've got a flying school, so you've got aeroplanes buzzing around, or where there are other operations like gliders or parachute jumping, it just becomes a bit more complex."

Not such a good fit

The arrival of businesses from closely managed larger airports can also create some friction when local services are not what they are used to. The pressure for the local airport to upgrade to meet the needs of its new tenants can sometimes put operators of smaller airports into uncharted waters.

"There's pressure on the ALAs, the unregulated aerodromes, from these businesses trying to find somewhere more financially viable," Tonkin says, "not withstanding those other challenges about having qualified people and expertise and access to other businesses that support or complement what they're doing.

"There's a challenge in funding those upgrades and some of these aerodromes don't have the management and strategic frameworks in place. They might have a master plan, but some of the master plans we're coming across don't help them much.

"And then they've got to get the money. And so a couple of these projects that we're working on, the airport operators or owner or the council have funding to do something and sometimes that something is not very well described or thought through, and it causes some concerns to the local operators. It's every aerodrome owner trying to provide the facilities and infrastructure that the stakeholders want, but affordably. And what we find is that most of these councils are running the airport at a loss already and whether or not they get grant funding for the infrastructure, they've still got to maintain it. And in their accounting system new infrastructure means additional money needs to be set aside to maintain it in the future. So it levees on them a cost that doesn't normally get thought about very much."

"There's a lack of expertise and knowledge sometimes. That was a while ago, but we're still seeing it now, the lack of appreciation of what they actually have, whether it's just for recreational purposes or whether it's an enterprise, generally it needs more than they provide in terms of staffing and expertise."

Becker Helicopters will leave the Sunshine Coast after 25 years of operations.

For some businesses, lower historical costs may have created a business model that no longer works with the new charging regime at major airports.

"There's a lot of flying schools that have all those qualifications and the regulatory requirements and they don't pay much to occupy their site and they don't have many overheads, so it's still viable. But when it becomes a situation where the council or the airport owner says you need to start paying proper fees and charges, it becomes unviable. And I think that's the crunch point.

"Real businesses making real money are probably okay. But then I give you the example of Becker Helicopters on the Sunshine Coast. They're basically so successful that they'll have to move because they're upsetting their community so much with the helicopters flying around the place."

In January Sunshine Coast operator Becker Helicopters announced it would pull out of its 25-year home and relocate to Whyalla in regional South Australia.

"It's a crying shame to have to pick up your operation and move it to another state just to make it work," Tonkin said.

Bankstown Airport today is a ghost town compared to the movements of 30 years ago.

Something to answer for

Ken Cannane, executive director of the Australian Aviation Maintenance Repair and Overhaul Business Association (AMROBA), believes many of today's issues stem from an airport privatisation process that didn't identify Australia's airports as assets that still needed to be maintained as important assets in a national transport infrastructure.

"One of the issues that I have with the concept of what they did with the airports is that I think it's mainly because the airport management and the association

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don't look at the industry as a whole and what people want out of the aviation industry," Cannane told *Australian Flying*. "They're looking for the profit/loss margin of operating an airport and their attitude is well if you want to be on the airport you're going to have pay a lot of money. Whereas most of those airports, the biggest benefit of those airports is the local community.

"Our version is that if you want to close the airport down then it's the local community that actually ends up being worse off, because they lose the ability from that airport to go and do business. And trying to make the business pay for the airport is probably the wrong concept from our point of view."

Cannane believes that airports, particularly in regional and remote areas, still need to be recognised as vital communications links for their communications, and should be funded and managed accordingly.

"If you go through some of the regional Australians which virtually have lost aviation off their airport, the local communities, they're not doing the best compared to the airports where there is a bit of a failure in giving to the aviation industry.

"And if you don't have a decent airport then your emergency services needs can't be fulfilled properly anyway. Without the airport there you just can't get the services there to help with those emergencies.

"The master plan can be controlled by the minister to make sure that aviation is the primary thing, but the prices they're charging now are actually starting to push a lot of people off the airports.

"I was talking to a prominent aviator, he's been around a long time, he's had twin-engine aircraft and large size twin engines that he's used personally and for business. The rent factor that's now been pushed up at Bankstown has made him look at the economics of it and he's said he's about to sell the aircraft and go back to traveling on commercial flights."

He said aviation related businesses specialising in components or services were already beginning to shift off airport, with some enjoying stability of rent and tenancy that non-airport companies have taken for granted.

"where the council or the airport owner says you need to start paying proper fees and charges, it becomes unviable"

"Most businesses now, if you're not doing aircraft maintenance, if you're only doing component maintenance, you can actually find business facilities off the aerodrome at much lower rents than what they are on the aerodrome.

"The tenancy is permanent, they can actually lock it down. They said they don't have to worry about whether the local airport's going to up the rent or demand more out of them. But those that are involved with doing direct work on aircraft are caught and they're struggling. Most of them are saying the extra costs are the difference between being viable and not being viable. These rents are just going to push them past the limit."

What it was

Ken Cannane remembers a bustling Bankstown that was a city in its own right.

"You go back 30 years ago, you had private aircraft flying all around this state on a regular basis every day of the week. Today you're hard pressed to find a few aircraft operating in and out of there. I can remember when I first started out of Bankstown and there were 2000 aircraft parked at Bankstown airport.

"I was actually surprised at how much companies worked together with each other, even through they were in competition. If one didn't quite have the expertise in one area they'd just ring the opposition and the bloke with his bit of tooling and equipment would wander across and finish off whatever the job was. The cooperation between businesses was excellent.

"You've got to look back and say 'well look the old Department days actually did an excellent job of creating and developing an aviation industry in this country'. The problem is that when they started changing over and hiring people without regulatory backgrounds.

"Now I just think a lot of the airports have given operators the job and they say we don't want to have anything to do with it, go out and make a profit out of the airport. And that in Australia has been very damaging to the aviation industry."

He believes pricing operators and private owners out of an airport may eventually sound the death knell of both the airport and private aircraft ownership, particularly if the next best option is a greater distance from the owner's home.

"I think the most damaging part of it is that where you once said I own an aircraft and I live in Manly, I suddenly say 'I'll take my aircraft from Bankstown and put it down in Goulburn.' How often are you going to drive all the way to Goulburn to fly your aircraft? After about five years you'll be saying 'I'm hardly using my aeroplane now, I may as well sell it'.

"There's more Australian registered aircraft for sale than ever before. And the reason is that it's become too expensive for them to accommodate the aircraft. Not just the operating, but to keep it at an aerodrome."

In the end

In Cannane's eyes, the Federal Government needs to inject just a little bit more oversight back in to our airports to ensure an altruistic view of their importance.

"I believe that the privatisation bills that went through parliament probably need to be looked at politically, so they can get the principle put in to the legislation to make sure the airports are driven to help develop aviation businesses instead of trying to just tax them out of existence.

"All the government was considering when they did things was to shift the cost of aviation off the government purse. And they didn't care who paid for it. Or they didn't care about the repercussions it did to the small industries in this country."

Melbourne has the luxury of larger airports no so far out of town that can provide relocation options.

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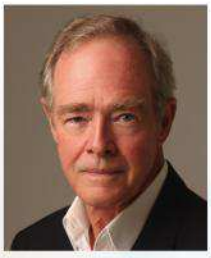
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Decrypting the Magic Smoke

It's been more than five years since the Australian ADS-B rules were finalised, but general aviation aircraft owners still face a bewildering array of products, configurations, rules and standards when investing in equipment that complies with the regulations. **Andrew Andersen** examines the options.

Automatic Dependent Surveillance–Broadcast, or ADS-B for short, continues to rank high in hangar talk all around the country. For many owners, the IFR mandatory requirements that came into effect last year at lower levels forced their hand, and much of the IFR fleet gained new navigation systems and transponders in order to comply. Some who had a choice simply decided to operate VFR until ready to take the plunge, whilst others confine their IFR operations to private flights in Class D and G airspace and take advantage of the temporary time extension CASA provided last year. Whichever way you look at it, ADS-B is not going away and amazing new navigation systems, which have emerged in the last five years, complicate choices for aircraft owners.

The requirements

The legal basis for the ADS-B and IFR navigation requirements reside in CAO 20.18. That order covers a lot of operational rules, but the ones relevant here are those in relation to IFR navigation equipment, transponders and ADS-B.

IFR navigation

Performance Based Navigation (PBN) has been planned for Australia for about the same time as ADS-B, and sometimes the two subjects are incorrectly confused. PBN rules apply to only IFR aircraft. General aviation IFR aircraft must be equipped with at least one Global Navigation Satellite System (GNSS) for flight in Australia. There are two permissible standards:

- TSO C129a equipment, which has been around for more than twenty years, and includes the familiar Honeywell Bendix King KLN 90B and KLN 94; and the "non-W" Garmin GNS 430 and 530. IFR aircraft with TSO C129a equipment must also have a serviceable VOR or ADF.
- TSO C146 equipment, which has been available since 2005, and includes the Garmin GNS 430W, 530W, G1000 and GTN series of navigators, as well as the Bendix King KSN 770 and Avidyne IFD 440 and 540 navigation systems.

Even though the navigation and ADS-B requirements are separate in law, there's a big "gotcha": none of the general aviation TSO C129a equipment can be used as a position source for ADS-B. Owners of existing TSO C129a equipment have to decide whether to keep their navigator and add another source of position information or replace it with one able to serve both functions.

Transponders

The rules in CAO 20.18 also include "forward-fit" requirements for Mode S transponders that apply to many VFR aircraft, too. This doesn't mean that those aircraft have to equip with ADS-B, or even replace any equipment, but new and replacement transponders must utilise Mode S and be able to transmit ADS-B if integrated with a GNSS position source. New aircraft, (including recreational aircraft registered with RAAus) are required to have a Mode S, ADS-B capable transponder if they operate in Class A, B, C or E

MAIN IMAGE: Touch screen technology such as that on Garmin's GTN range is making navigators easier to use.

BELOW LEFT: Trig TT31 transponder

airspace or above 10,000 feet in Class G airspace.

ADS-B

The regulations in Australia, the USA and elsewhere, only specify requirements for ADS-B OUT, which are broadcasts sent from aircraft. Although there are obvious benefits, there are no regulatory requirements for ADS-B IN, where an aircraft receives ADS-B from other aircraft.

ADS-B information sent from IFR aircraft must include integrity information that satisfies the requirements of CAO 20.18 (FAR 91.227 in the USA is even more stringent). The integrity information can only be provided by a TSO C145 sensor, or TSO C146 GNSS. This is a big deal, because TSO C146 navigation systems are much more expensive than ADS-B transponders.

Australia permits the use of 1090ES technology only, which operates on the same frequencies as radar. In the USA, UAT is available as an alternative for aircraft that fly below the flight levels, but it can't be used internationally and still requires a transponder.

First Fundamental: architecture

It seems many owners don't think enough about what they really need, and just ask their avionics supplier to quote "something that will give them ADS-B". That's a bit like going into a car dealer and telling a salesperson that you want a car. It's a fair bet that the first one you're shown won't be the smallest vehicle in the showroom.

It's easy to assemble a wish-list of avionics that might be rationalised as "needed" for PBN and ADS-B. But are they really? We've seen above that IFR flight is perfectly legal with a 20-year old TSO C129a navigator, so what are the options to economically equip with IFR-compliant ADS-B?

1. If ADS-B is the only goal, an owner can purchase a transponder that has its own inbuilt GNSS position source, which does not need to be connected to the aircraft's GNSS navigation system. There are three products in this category, which can be ordered with an inbuilt GNSS. Some also offer other options for traffic and weather awareness.
   - Appareo Stratus ESG
   - Garmin GTX 335 and 335R
   - L3 Lynx NGT-9000.

   This approach is often the simplest, and lowest cost means of equipping with ADS-B, with deals available for supply, installation and paperwork for less than $10,000. The downside is that these systems offer the pilot nothing more. A variation of this approach, which some aircraft owners have chosen, is to equip with a separate, stand-alone GNSS sensor, certified to TSO C145, interfaced to an ADS-B capable transponder. This can be attractive in aircraft that already have a suitable transponder, but an older TSO C129a navigation system. Products in this category include the Trig TN70, Aspen Avionics NexNav Mini, and the Freeflight Systems 1201 and 1203C sensors. Professional advice is needed before purchase, since not all sensors can be readily integrated with all transponders and costs vary between manufacturers and models.

   On their own, these products don't provide large-format displays, additional navigation information, or replace round-dial instruments. All they do is provide GPS position information, with the required integrity parameters, to a compatible transponder; but it will give an aircraft perfectly compliant ADS-B, often at less than a third of the cost of other alternatives.
2. Owners who want new navigation systems can purchase new GNSS equipment certified to TSO C146. When connected to a new ADS-B compatible

Avidyne IFD550

transponder, the aircraft will satisfy the ADS-B requirements, and often please the pilot with a satellite navigation system that extends far beyond the basic capabilities of GPS 20+ years ago. This approach can be expensive, however: installing a larger format new GNSS products, such as the Garmin GTN 750, Bendix King KSN 770, or Avidyne IFD 540 will cost upwards of $25,000 and that is before the cost of a new ADS-B transponder. There are deals to be found, especially if pre-owned equipment is acceptable or existing equipment can be traded.

Consider compatibility between the navigation system and transponder, not just now, but in the future. Choosing the same manufacturer for both reduces the risk of future incompatibilities when upgrading to new software revisions.

There is plenty of choice in the navigation systems market, as discussed below, and owners often choose to enhance new navigation systems with additional, or replacement, compatible equipment, including:

- Primary Flight Displays (PFD), such as the Garmin G500/600 series and Aspen Avionics display families. PFDs can replace the round-dial attitude indicator, altimeter, and airspeed indicator, although aircraft certification rules often require retaining some of the old instruments for backup. The most recent PFDs have sharp, full colour displays, and include electronic attitude and heading reference (AHARS) systems, and optional synthetic vision and a range of available interfaces to other equipment. They are not cheap but provide the pilot far greater situational awareness than older analog instrumentation.
- Multifunction Flight Displays (MFD) are used to present navigational, weather and traffic information to the pilot. Whilst an MFD is incorporated in the large-format new GNSS products, it is not unusual to find aircraft fitted with an addition MFD to display ancillary information, such as charts, weather or traffic.

Princely Sums

Prices for PFD and MFD installations vary enormously depending on the complexity of the installation and interfaced equipment and except for the most simple, VFR-only installations, run to another 5-figures.

As a very rough guide, retro-fitting an IFR piston single with new GNSS, ADS-B transponder, and PFD/MFD can cost $70,000 or more once design, installation and engineering approval are considered.

PFDs and MFDs do not include GNSS or transponder functions. Typical PFD installations include pitot-static plumbing, altitude encoder connection, and interfaces to GNSS, autopilot, ILS/VOR, ADF, temperature, weather and traffic sensors.

Choosing a Navigation System

From here, let's assume that you've decided to have a new navigation system installed in the aircraft. There are a couple of important things to know at this point:

- **New GNSS systems are computers, not instruments.** Not only is there a lot to learn in buying and installing one, but there will also be a lot to learn in using it properly. Like all computers, GNSS systems have:
  - Hardware, with multiple electrical connections, much associated wiring and components that need cooling and careful handling
  - Software, that will change between revisions provided by the manufacturer, and which you will probably upgrade several times during the life of the product to obtain new functional features and improvements
  - Data, which comes from:
    - Sensors on the aircraft – for example, altitude encoder, GPS antenna, weather and traffic sensors, where fitted
    - Input from the pilot – for example, flight plans, user waypoints and direct-to commands
    - External sources – particularly as navigation, chart and terrain/obstacle databases.
- **GNSS systems communicate with other avionics in the aircraft** using one or more standard communications protocols or formats, which are usually exchanged over an ARINC 429, Ethernet, or RS-232 serial interface port. If this all sounds like gobbledygook, relax ... you're far from alone. Matching protocols and ports is a task for an avionics professional, but mentioned here because not all functional capabilities are available for all protocols and interface ports. For example, curved procedure legs may not be displayed on a PFD when connected to a GNSS with RS-232, but some revisions of transponders must use RS-232 connections to generate compliant ADS-B output. The need for detailed product knowledge and installation skills are why purchasing from an accredited avionics supplier able to provide installation services and after-sales support is so important.
- **GNSS systems do the same things differently,** and whether one is preferred over another is often a subjective assessment. Whilst all GNSS systems do the same basic stuff, there

> **"If this all sounds like gobbledygook, relax ... you're far from alone"**

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CLOCKWISE FROM TOP:
Freeflight Systems 1203C
Garmin GTN 750
Garmin's GTX 335 transponder

are big differences in the way different products work. Those who learned to fly in the 70s or 80s remember when nav/comm radios all had similar, basic controls, and a King Silver Crown VOR worked exactly the same as Collins or Narco; a pilot would get out of one aeroplane and into another without giving the nav receiver a second thought. This is not true now, and it's not just the GNSS functions, because most GNSS systems are actually complex Flight Management Systems (FMS), and often replace the humble nav/comm radio. It's advisable to study the pilot's guides, and get a demonstration before committing to purchase anything.

– **Size and Form Factor:** older GA aircraft frequently have limited panel space, so often the first decision about a new navigation system is its physical size. If you have the room, the 175-mm diagonal Garmin GTN 750 display is the most impressive of the retrofits, but if a separate PFD/MFD will also be available, it might not be worth around 90 mm of panel height. However, the map features on smaller-format products are necessarily limited, and they can't display Jeppesen charts, as the larger-format models can.

– **User Interface:**

- Style and type of menus? The Garmin GTN series is big on touch-screen icons, which take the user through nested menus without surrounding hardware buttons. The Avidyne menu selections can be made with either hardware buttons or touch-screen, and use little nesting, so you can move fast between functions. Bendix King menus are consistent with those of Aspen Avionics, including user-definable split screens, which may be appealing in aircraft already equipped with an Aspen Avionics PFD.
- Touch screen, soft or hard keys (buttons), or both? Touch screens have the advantage of maximum flexibility and presentation size: the unit can switch from an alphanumeric keyboard to a digital key pad without any input from the user, and if there are no buttons, the screen can be larger, and easier to read. On the other hand, some pilots find touch screens harder to use in turbulent conditions. The Garmin GTN series are all touch screen, with dial controls for volume and emergency use, whilst Avidyne and Bendix King have both touch-screen and hardware keys around the display edges; the KSN770 also has a cursor control device, similar to large aircraft avionics.
- Alerting and status displays vary between products and may include external annunciators
- Display customisation, allowing pilot choice of where and how navigational and other information is shown.

– **Screen Resolution:** The clarity of text and graphics is a function of display colours, brightness, and resolution. In the large-format products, the Bendix King KSN 770/765 and Avidyne's IFD 550/540/545/510 models are 640 x 480 pixels, while Garmin's GTN 750/725 models are 600 x 708 pixels. The smaller format products from Garmin are 600 x 266 pixels, whilst those of Avidyne are 640 x 235. Don't get obsessed with these figures, though: lots of pilots are into their second decade of flying with the Garmin GNS 430, which has a display resolution of 240 x 128. Screen resolution varies among PFD and MFD

products, with Garmin's G500/600 TXi now the clear leader in that space at 480 x 800 pixels for the portrait format display. More powerful screen resolutions show off 3D synthetic vision functions, and detail such as charts and airways/waypoint labels, far better than earlier, lower resolution models.

– **Features, Features, Features:** All these systems do almost all these functions, one way or another. The real difference between them is how the functions work:

• **Graphical navigation** map: more detail, on the larger products, is more useful. Look out for:
– Ease of zooming (in and out) and panning (moving around) the map
– Cluttered screens, and clarity at different zoom levels
– Colours, including the ability to dim or remove at night
– Geo-referenced Jeppesen charts (Airservices Australia charts aren't available), and how they are displayed. This also means being able to easily change the map orientation from heading or track-up, to north-up
– Graphical (drag and select) flight planning and modification on the map screen
– Integrated attitude reference and synthetic vision, which is only available in the Avidyne IFD 550, which for some aircraft owners, might mitigate the desire for a separate PFD.

Avidyne IFD540

• **Flight plan entry**, either by the use of waypoints or routes

• **Terminal procedure selection,** including finding the best initial approach fix, activating the procedure, and suspending it, for example, when holding

• **Support for wireless interface** to upload a flight plan from, or interact with an EFB tablet, and to load navigation database updates from a computer

• **Waypoint/name completion:** Avidyne calls this feature GeoFill, whilst Garmin's corresponding feature is FastFind

• **Integrated Nav/Comm radio,** including options for higher (16W) transmit power

• **Vertical navigation,** including time to top of descent, required rate of descent, altitude labelling of approach legs, and related functions

• **Integration capabilities,** especially to display radar and Stormscope weather, traffic, audio panel, transponder functions, PFD/MFD, fuel flow and autopilot compatibility

• **SBAS** (WAAS in USA): all TSO C146 systems have SBAS capability, but it will only be any use if the current trial produces an operational, ICAO-standard SBAS for Australia

• **Other features** including check lists, nearest airport/navaid/waypoint information, holding patterns and sector entries, terrain and chart databases

• **Database updates,** including cost, source and availability of updates. Garmin and Avidyne databases for Australia are currently sourced only through Jeppesen, and Australia-only databases are only available for Garmin. Bendix King database updates are obtained from Honeywell. Garmin products use a specially-encrypted data card, whilst Bendix King and Avidyne systems utilise a USB stick.

Coming up Short

Depending what part of the government you ask, Australia either has or doesn't have a pilot shortage. **Philip Smart** investigates some realities and what it means for those trying to get their first CPL job.

In February this year Qantas announced it would establish a pilot academy capable of training up to 500 pilots a year.

The Qantas Group Pilot Academy is expected to open its doors to students during 2019 and will initially train around 100 pilots a year for direct entry into the Qantas Group, including Jetstar and regional carrier, QantasLink. Depending on demand from other parts of the aviation industry, this could grow to 500 pilots a year on a fee-for-service basis.

Qantas Group CEO Alan Joyce said the academy is partly a response to the rise in demand for aircrew fuelled by meteoric growth in airlines, particularly in the Asia Pacific Region.

"Boeing estimates the world will need about 640,000 more pilots in the next 20 years, with 40% in the Asia Pacific region," he said. "That level of demand makes the academy important not just for Qantas, but for Australian aviation more broadly so that all parts of the industry have access to qualified pilots in a country that relies so heavily on air transport.

"Over time, we see potential for the academy to become a competitive advantage for Australia in the region. It could train pilots for other airlines and grow into the largest academy of its kind in the southern hemisphere," Joyce said.

Announcement of the pilot academy follows close on the heels of a QantasLink regional airline initiative that will see students at five universities mentored by experienced pilots, with an opportunity to join QantasLink straight after graduation.

The Qantas Future Pilot Program, announced in December, will give students the opportunity to be mentored by experienced QantasLink pilots throughout their studies.

AVIAIR

Successful candidates will be invited to complete an intensive twelve-week Airline Transition Course at the completion of their degree, then finish their training before moving directly to the right-hand seat of QantasLink's Bombardier Dash 8 Q300s and Q400s. Based on current university intakes, the program will be open to around 300 students per year.

A few pilots short?

The question of whether "high demand" could be translated as "pilot shortage" has many answers depending on where you sit in the industry. Expansion of low cost airlines across the world suggests that they are finding pilots to operate new aircraft. Qantas finished a training hiatus in 2016 and went recruiting for 170 positions, while Virgin Australia has hired around 120 over the past year.

But growth of overseas carriers and the much-touted mega-growth in Asia has a ripple effect all the way to the Australian outback. International airlines poach from Australian domestics, which then poach from regional airlines and so on down the chain.

If the growth hype is correct, Qantas may not even find its academy providing enough pilots for future growth. Regional airline Rex has run its own pilot academy since 2007 and averages three intakes a year to feed its fleet of more than 50 Saab 340 aircraft on some 1500 weekly flights to 59 destinations throughout all states in Australia.

When the Federal Government relaxed visa regulations to again allow foreign pilots in to Australia on two-year work visas in December 2017 (after suspending them in April of that year), Chief Operating Officer Neville Howell praised the change, citing a doubling of cancelations in the previous six months through a shortage of pilots.

"Rex is the only airline in Australia that has its own pilot academy and we have invested over $35 million to ensure our own pipeline of pilots to meet our crewing needs," he said. "Even then, we still had to supplement this with recruitment drives over the years in the UK, South Africa and USA. Rex speaks with good authority when we say that the need for good experienced pilots cannot be met locally."

Honorary Chair of The Australian Aviation Associations Forum (TAAAF) Greg Russell is in no doubt.

"There is a recognised pilot shortage," he told *Australian Flying*. "I came out of the regional sector of the industry where traditionally we had drawn people from the general aviation sector in to regional airlines. From there we had them poached from us to the domestics. What's happening now from discussion around the industry is that the domestics are being poached themselves by the big internationals, so the likes of the Chinese airlines, Gulf, and I think Delta's even been out here as well.

"And that's occurring at a time of two other issues. One is new fleet introductions, such as the 787 introduction that Qantas is going through. And also the broader issue of growing demand for aircrew, particularly in the Asia Pacific Region.

"This isn't going to go away any time soon in my view. The issue's always been around, but I'm hearing it's got a lot more serious in recent times."

Not on the same page

But not everyone agrees that a pilot shortage is purely from natural attrition, or that short-term visas will solve the long-term issue.

VIPA, the union representing more than half the pilots in the Virgin Australia Group of airlines, called for a government white paper on the shortage of pilots in December last year.

VIPA President, John Lyons said that the shortage has been apparent for some time and that the government reversal of its position to grant 457 visas was not going to remedy the problem.

"The problem is systemic in that the traditional sources of recruitment for airlines has dried up," Lyons said. "General aviation has been forced into decline largely because of an over regulated, punitive system enforced by CASA and the flow of experienced RAAF pilots has dwindled."

VIPA maintains that the implementation of costly regulatory changes such as Part 61, Part 141 and Part 142 of the Regulations, have hurt training organisations without contributing to safety.

MAIN: Operators such as Western Australia's Aviair are losing pilots to the major airlines sooner and more often.

STEVE HITCHEN

LEFT: Regional airlines are the link between general aviation and the major airlines, ensuring a high pilot churn.

BELOW: Regional Express sources pilots from its own academy: Australian Airline Pilot Academy in Wagga Wagga.

REGIONAL EXPRESS

"In the old days we used to say you could shake a tree in Kununurra and the pilots would fall out"

"Thirty years ago the general aviation industry was thriving. It employed a lot of pilots and licensed engineers which provided an experienced source of recruitment for the airlines. Stifling regulatory changes and prohibitive costs have forced many general aviation operators and flying schools out of business," Lyons said.

VIPA acknowledged that recruitment of experienced pilots has had an impact but did not believe that it is the prime cause of the pilot shortage.

Lyons also said young people entering the work force today are not attracted to a flying career because of the availability of alternative high-income careers which do not require an investment of more than $100,000 to gain basic qualifications.

It's a view shared by the Australian Federation of Air Pilots (AFAP), one of the country's major pilot unions.

When the Federal Government originally moved to abolish 457 Visas in April last year and remove many flying career positions from the list of occupations eligible for a temporary visa, the AFAP saw it as a way of forcing Australian operators to recruit locally.

"The decision to remove aeroplane pilots, helicopter pilots and flight instructors from the eligible list of occupations for a temporary visa is long overdue," said AFAP President Captain David Booth at the time.

"For many years the AFAP have alerted Government to the abuse of the old 457 Visa program by certain employers. There are plenty of suitably qualified pilots within Australia. Aviation companies need to spend the time and money investing in the training of their Australian pilots, not looking for cheap short term fixes via imported labour."

"We understand that that there may be occasions where it is appropriate to source specialised skills from overseas however there are more appropriate avenues to do this and the previous 457 Visa program was simply being abused by a number of employers in the aviation industry", said Captain Booth.

Shortage? What shortage?

Writing for the AFAP website in January, retired airline pilot and current ATPL/Type Rating Examiner, Gordon Bretag, argued that Australia does *not* have a pilot shortage and pressure should be applied to airlines instead of granting work visas to pilots.

Bretag argued that, apart from the period of the 1989 pilot dispute, "Australia has never had–and still does not have–a shortage of suitably qualified commercial pilots."

He believes airlines that recruit overseas pilots through short term visas are looking for bottom line savings, not the best pilot in the shortest possible time."

"Any airline could take a basic CPL, IR MEA pilot and within two months have that pilot flying as a co-pilot on revenue operations," he said.

"Contrast this with importing a foreign pilot who already has the Type Rating and experience in excess of the basic CPL holder. This pilot must complete three CASA examinations to validate his/her foreign licence. Additionally, the airline will be required to complete some standardisation training and an Instrument Proficiency Check (IPC). At best, all this could be done in two to three weeks, but actual issue of the CASA licence will take another two to four weeks while qualifications are authenticated [more on this later] and medical standards assessed. The induction process required is exactly the same for an experienced foreign pilot as it is for a newly-qualified Australian CPL holder.

"In other words, there is no

STEVE HITCHEN

STEVE HITCHEN

LEFT: VIPA President John Lyons says GA has been forced into decline because of over-regulation, which impacts pilot recruitment.

BELOW: The right-hand seat on a regional airline is seen as the first step to flying for a major carrier.

time saving importing a foreign pilot, and the cost saving is only the difference between a full Type Rating and an abbreviated version thereof with mandatory IPC."

Bretag also argued that hiring local pilots made the critical task of fact checking their background and logbook much easier and more reliable.

"In conclusion, with the excellent conditions on offer in the USA, Middle East and China where they really do have a pilot shortage, many of the foreign pilots we are likely to attract will be those not good enough for the aforementioned countries. Particularly (and I have experience of this in my former life as a Chief Pilot) there will be those from certain countries who will bring with them falsely-acquired accreditations and claims of experience."

His alternative is to apply pressure to airlines to recruit Australians before looking overseas, to drop arbitrary non-industry academic requirements in minimum levels, insist on a minimum experience level of 250 hours in command, require a one hour simulator flying skills test as part of the recruitment process and for industry and government to establish a joint venture flying academy for the future.

At the coal face

Whatever the cause, for smaller operators the pilot shortage manifests as existing pilots spending less time earning their spurs before moving on to bigger things. It's driving up recruitment and training costs and making it harder to hang on to good employees.

Kimberley-based Aviair flies 27 aircraft including Pilatus PC12s, Beechcraft B200 King Airs and Cessna 208s on regular passenger transport (RPT), charter, scenic flights, air freight and mining support from its bases at Kununurra, Broome and Karratha.

Sales and marketing manager Sonja Mitchell said the flow of pilots out of Aviair to the major airlines had measurably increased, compounded by a stem in the flow of new junior applicants.

"In the old days we used to say you could shake a tree in Kununurra and the pilots would fall out," Mitchell told *Australian Flying*. "But there's massive growth in the airlines, especially low cost airlines world wide. Airline pilots that have been flying for a long time have reached retirement age, so there's a faster intake from the airlines to replace them. And they're also accepting new pilots at a lower level of experience than they used to.

"So for pilots it's fantastic, because they're having a much faster career progression. But of course operators in regional areas like us, where pilots come to get valuable experience, we're not getting as many. So it makes it harder."

Outback flying has long been regarded as a valuable apprenticeship, where pilots build hours while learning that a successful flight and commercial operation is about much more than just their stick and rudder skills. Passenger handling, an understanding of airline economics and the management skills and confidence that come from having to manage flights in and out of remote areas are all picked up virtually by osmosis with a few years in the bush. But with airlines hiring pilots with fewer hours, that apprenticeship is being curtailed as opportunities come over the horizon much earlier in a pilot's career.

"Most fixed wing pilots want to progress to an airline role," Mitchell said.

"That's their end aim, so if they can get there quicker they're going to take the quick path. And because there are more required because of the growth airlines, they move through the ranks quicker now. We put rigorous training in to all our crew, and that training cost is generally absorbed over a four to five year period, which is the average length of stay for our pilots. Now they may only stay two years and we're having constant recruitment and training of new crew which is very expensive."

And ironically, a reputation for high-quality pilot selection and training can just compound the issue.

"We're looking for that extra bit, it's not just somebody that can fly. For us in the regions we need pilots with commonsense and initiative because our flying is demanding.

"You're in and out of unusual airstrips; you've got short airstrips, one-way airstrips, different climatic conditions. And you're dealing with it from the beginning of the job to the end, from loading baggage in and out of the aircraft and working with the operations team and maintenance crew personally. Working at Aviair you can actually see what makes an airline run.

"Aviair has a really good reputation. We pay well, our pilots have really good conditions and we train second to none because we're an RPT operator, so obviously we're training to that high level. That does make our pilots very desirable for the airlines."

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Lessons from a logbook

JIM DAVIS

Jim Davis has a passion for instructing. He has been training civil and military pilots, in the air and on the ground for 50 years. His other passion is writing, which he studied at Curtin University in Perth. You can see, and buy, his two pilot text books PPL and Flight Tests at www.jimdavis.com.au

Climbing the Learning Curve

Jim Davis *recounts four episodes where misadventure became a good teacher.*

"Davis, get your useless butt in that Cherokee, take it to Rand Airport and bring back a Tri-Pacer for me."

"Sure thing, Skipper." I am half-way out the door when he calls me back to give me details. "And don't drag your heels – I want it now!"

"Okay – got it Skip – I'm on my way."

"And Davis…"

"Yes Skip?"

Zingi, adjusts his bow-tie, shakes his head very slightly and gives me an almost despairing look. "Don't bugger it up."

Really ... some people! I bolt out to out across the dirt to the Cherokee.

It's the middle of 1964. I have a bit over 100, carefully penned, hours in my logbook. It's not enough for me to realize how little I know, and what a massive learning mountain I have ahead of me. I land at Rand Airport, park the Cherokee and leg it into the hangar.

As so often happens when you are in a hurry, fate is not on your side. This miserable looking green and white Tri-Pacer sits lopsidedly at the very back of the hangar. Green is not a good colour for an aeroplane. It's covered in dust and has a flat tyre. Worse still, it looks as if it is harbouring a young colony of spiders.

I have to enlist the assistance of helpers to pump the tyre, move half a dozen aeroplanes and vacuum the web builders from the dingy recesses behind the instrument panel.

It is fortunate that cell phones were not part of life in those days. I could visualize Zingi blowing a gasket when I was not back at headquarters within a couple of hours. Hell, I was doing my best, but the Gods were not on my side. There was a further delay when I found the battery was stone flat. What else could you expect? Jump leads were produced, and after a bit of chugging and chuffing the engine spluttered into uneasy life. As it warmed up the cabin filled with that smell of old engine oil mixed with grime.

> « Not to put too fine a point on it, we were about to become a splat of strawberry jam on a rock face. »

For those not familiar with Rand airport, I should explain that it is all uphill to the threshold of 29, and thereafter all downhill. This uneven topography was to influence my immediate future.

The uphill taxi meant that I had no call to use the brakes. Also there was no reason to stop at the threshold. There was no traffic and the tower cleared me to take off as I approached the runway. By now, I was so late that I decided to dispense with the customary pre-take-off rituals. Hell, the fuel was switched on, the flaps were set and the door was shut, why waste time? As we turned onto the runway, I moved the throttle all the way forward.

Now, Tri-pacers came in four flavours: some had 125-hp engines; others 135-hp. Then there was the sprightly 150-hp version and finally the mighty 160-hp model. I had been in such a hurry that I had no idea which variety this one was, but its response to full throttle caused me to suspect that it was somewhere off the bottom of the scale.

Acceleration could best be described as barely discernible. I juggled with the carb-heat and mixture, but nothing made much difference. After a while it became obvious, even to me, that this particular Tri-Pacer, despite the downhill slope, was really not very interested in flying. It's no use arguing with an aeroplane when it is in that sort of mood.

The wretched, spider-infested Tri-Pacer seemed to have entered

A pilot's logbook is far more that just a record of dates, times, places and flights; it is also a history of a pilot's flying career and a chronicle of the lessons learnt that makes them the aviator they are today. Jim Davis takes a look back through his own logbooks, and records the incidents that have shaped his approach to flying.

BRUCE PERKINS

MAIN IMAGE: Trikes came with several different engine options. Jim just didn't know which one he had.

BELOW: Salisbury Airport in Rhodesia. Jim and Bomb-doors had a bit of an adventure getting there.

an area of feeble air – I knew we would not encounter sufficient lift to get us off the runway.

I hauled the throttle fully back and reached for the handbrake, which hung below the centre of the panel. As I yanked it back it simply clanged up against panel ... and we seemed to go slightly *faster* down the sloping runway.

Obviously, if I had done a run-up at the threshold, I would have discovered the machine's lack of enthusiasm for both going and stopping.

What saved my skin, and certainly my job, was my previous tailwheel flying. I did know how

WIKIMEDIA COMMONS / CLIPPERARCTIC

BRUCE PERKINS

LEFT: It was in a Cherokee 235 that Jim mutinied on his way to Salisbury.

BELOW: The dreaded Matopo Hills in Zimbabwe. Not something you want to encounter in "guti".

to shed speed by ducking between runway lights, bouncing onto the grass, and then swinging into a wild ground-looping turn to face uphill.

Almost worse than the emotional shock and shame of this episode was the wrath of Zingi. You know when someone is really angry with you, and they go all quiet at the beginning of their sentence, and speak very slowly and deliberately, and then scream the last few words?

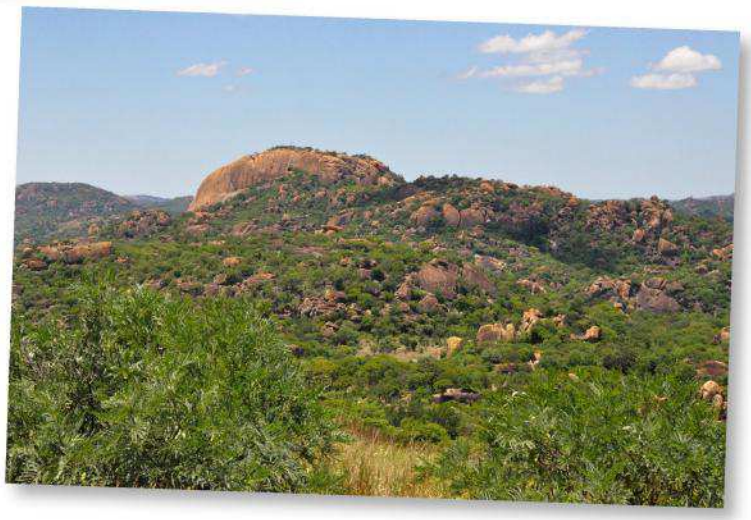
"Davis, what was the very, very last thing I told you before you left?" That was the quiet bit. It was followed by the thunderous bellow, "*don't bugger it up!*"

I felt like something he had found crawling out of his lettuce.

As I may have mentioned, I am a slow learner, so even that bit of idiocy, together with Zingi's screaming, didn't fully teach me the value of pre-take-off procedures. I only really came to grips with that about a year later when a Twin Comanche got close to eating me. I will tell you about it another time.

Bomb-doors and the Matapo Hills

My next lesson was of a very different sort – it was all about CRM (cockpit resource management). In fact, the term hadn't been invented then. Perhaps I invented it! But even though it wasn't part of aviation lexicology, it certainly applied to this scary flight.



The protagonists were a 235 Cherokee, some massive boulders, myself and one of my old instructors – the bristling little Major Bomb-doors Pidsley. He managed to combine the other two to frighten the hell out of me.

Zingi had briefed me to go to Salisbury (now Harare) in Rhodesia (now Zimbabwe) via Pietersburg (now Polokwane) with Bomb-doors Pidsley (now deceased) to pick up a passenger. We did this and then headed north for Salisbury.

I was flying from the left hand seat because we were using this flight as part of my conversion. So Bomb-doors, in the right hand seat, was PIC (pilot in command).

As we approached the great Limpopo River we could see a solid bank of low cloud ahead. And to the east, it stretched way off into the distance. But it looked as if it might break up towards the west, so we headed that way. There was no over-or-under decision – Bomb-doors didn't have a current instrument rating. So he directed me to descend to get beneath the muck.

When I describe the cloud as "guti", which it was, those who know this special form of Zimbo weather will wrinkle their foreheads and suck in their breath. This formation is caused by an influx of cold air from the Indian Ocean. It produces low cloud and drizzle that can hang around for days.

Neither of us knew enough to be concerned, we simply descended below it while heading further west – to avoid the worst of it.

This will cause even more sucking in of breath by those who know Zim. Our new heading would take us straight into the middle of the Matopo hills. These are not so much hills as a scattering of huge boulders – some almost Uluru-like – that rise almost vertically out of the landscape.

If you now combine the Matopo boulders, a layer of guti covering their tops, a light aircraft and a misty drizzle whose drops are too small to blow off the windscreen, you will understand the perilous nature of our action.

Scud-running in that area was a truly terrifying experience because we could only see the boulders in transit ... as they passed our side windows. We had little idea what lay immediately ahead. Not to put too fine a point on it, we were about to become a splat of strawberry jam on a rock face.

Although I was flying I was technically not in charge, but I felt the need to get the Major to climb us out of this mess. He refused, saying that his instrument rating was not current, and besides he was in the right-hand seat and couldn't see the instruments properly.

When you are about to merge with the vertical scenery, there is little time for discussion, so I am afraid I did a Mutiny on the Bounty thing. I spotted a mielie field about the size of a couple of tennis courts on my side. I told the Major that if he didn't take the controls and climb through the guti, I would land in the mielies. This was my bit of CRM.

Anyhow it got his attention. He took full power, hauled the nose up and leaned across my side to see the instruments.

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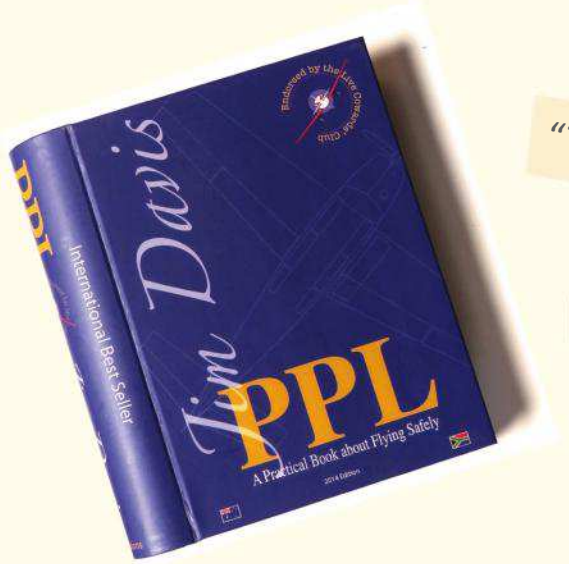

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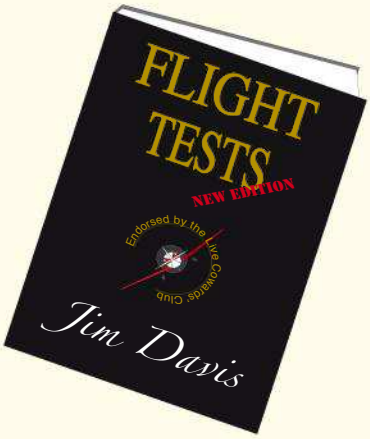

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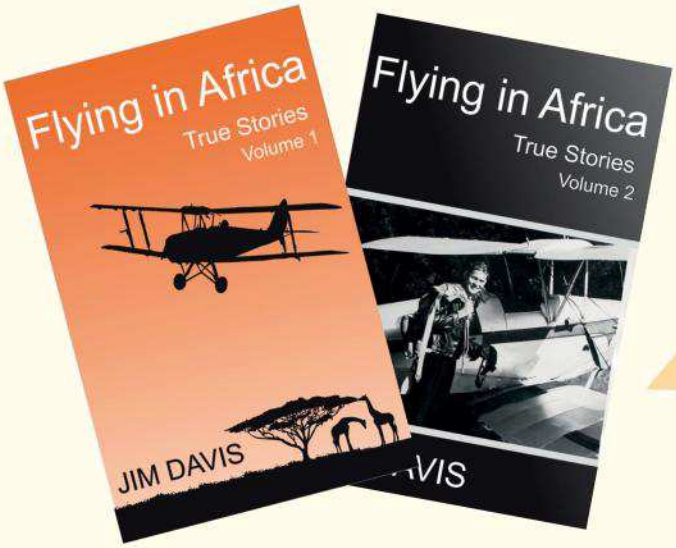

"True stories"

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GOOGLE EARTH IMAGE

Rand Airport: it wasn't until Jim was on the downhill take-off roll that the brake issue become known.

For a paralysing minute or two we sat in the muck wondering when we would see a dark shape surge out of the gloom and crush us to pulp.

Eventually we popped out into dazzling sunshine.

I took the controls and flew us to Salisbury. Not a single word passed between the Major and me. We landed at Mount Hampden airfield in complete silence. And neither of us ever mentioned this flight again. We both knew we had little to be proud of, and that nothing but brute luck had saved our lives that day.

Lord Elpus and the Trike

It's the day before Christmas, 1963. Zingi doesn't seem to notice that the season of goodwill is upon us.

"Davis, Mr Piet thinks I made a huge mistake when I employed you as a hangar-rat and salesman."

"Gee, I am sorry to hear that, Skipper."

He spoke slowly and deliberately. "I want you to prove to me, and to Mr Piet, that you are not a complete waste of resources. Tell me exactly how many aeroplanes you have sold so far?"

"Well, that would be … about none, Skip, but…"

"Don't give me backchat, Davis, today you are going to sell one. You are going to take the blue Tri-Pacer, Charlie Kilo Lima, out of the hangar, put fuel in it, and fly it down to Westminster, in the Orange Free State, and sell it to one of your tribe – a bloody Pom – Lord something-or-other. And then you are going to put his cheque in your pocket and get on the train and come back – second class. Have you got all that?"

"Sure thing, but…"

"Get the papers from Solly in the office, and if you don't sell the aeroplane, don't bother to come back!"

I phoned Lord Elpus, or whatever his name was, to make arrangements for my visit. His butler answered and said he would enquire whether his lordship was available. I could then hear his voice ringing through the mighty building as he explained that there appeared to be an aeroplane salesman wishing to converse with his lordship.

Eventually the great man picked up the instrument with a cautious, "Er, hellair?"

We soon agreed that I would arrive at around 2 pm. I wanted to be very sure that I would find his farm strip. "Oh, it's terribly easy old boy, it's a green strip of grass slap in between two bloody great wheat fields. You can't possibly miss it. And I'll collect you in the old Land Rover, what?"

> **and if you don't sell the aeroplane, don't bother to come back!**

Anyone who has flown over that part of the Free State at harvesting time will have spotted my problem. The whole country consists of enormous wheat fields separated by strips of green grass.

When I thought I was there, I picked the most likely looking patch and landed on it. It seemed more like an overgrown track for farm machinery. I waited around for a while, but no Land Rovers hove into view, so I took off again and mooched around the sky looking for a more likely spot – none presented itself.

However, I eventually observed a gentleman driving a huge green harvesting machine through the wheat. I landed behind him and enquired where I might find the Lord Elpus aerodrome. He pointed to a cluster of trees and a river bed less than a mile away. I took off and circled that area until I spotted a green bit that might just be considered to be a crop-spraying strip. Mistake, I went through two fairly substantial dongas, hidden by the long grass.

A local appeared out of the undergrowth and explained that his lordship was waiting for me in the adjacent field.

I braved the two ditches again, hopped over the fence and there was the Land Rover, together with a tweed-clad peer who waved encouragingly.

I finally landed on a chunk of territory that was not noticeably better than my three previous spots. Hardly had the propeller stopped turning than his lordship hauled the door open, stuck a skinny hand in to shake mine, and greeted me with the words, "I'll take it – just what I need, old chap, something that will land anywhere."

I spent the night in the Railway Hotel and next day took the early milk-train back to Pretoria, arriving that evening with a cheque in my pocket. Not a bad way to spend Christmas – rattling along in a train with the knowledge that I had a job to come back to.

Bladders

During the next three days, I logged 20 hrs and 15 minutes with Old Piet, in 235 Cherokee ZS-DUE, flying through South Africa, Swaziland and Mozambique. Here are some of the places we visited: Komatipoort, Lourenco Marques, Beira, Quelimane, Pietersburg, Mica, Stegi and Manzini.

I mention this for a few of reasons. First, at that stage of

my career, there were few better feelings than grabbing my logbook every evening and inking in the best part of seven hours. Second, I saw a vast amount of southern Africa that was new to me. And third, much of Old Piet's flying left a lot to be desired, which meant that I was able to learn a great deal about what not to do on these flights.

As Piet seldom told me where we were going, or how long we would be in the air, I quickly learned to empty my bladder immediately before each leg. This was all very well, but my temporary replacement was a bit slower off the mark with his potty training.

For a short while, Piet employed a far smarter co-pilot than myself. Don Rotheroe was the man of the moment. He was an extremely nice guy, and was always immaculately dressed in a light blue safari-suit. His hair was neatly parted and smarmed down with some goo, and he had pretty snazzy sun-glasses.

Unfortunately, Don's failing was that he simply didn't plan his ablutions as well as I did. On a leg of more than 800 nm, from Quelimane to Wonderboom, things got out of hand – his plumbing couldn't take the strain.

"Mr Piet, we need to land."

"I don't sink so."

"But I have got to have a wee-wee."

"So vare do you sink ve should land?" said Old Piet, waiving his arm generously round the scenery, to indicate a massive expanse of raw bush. "Here, use zis," he said, after digging in various pockets and pulling out a pair of earphones, wrapped in a plastic bag.

Don extracted the phones and viewed the bag with suspicion. Eventually he decided it would do the trick so he started squirming sideways to conceal the deed from his boss. After a while he confessed that he couldn't do it there, declaring that he felt the back seat might make a more suitable venue for the proposed decanting.

A young Jim beside Cherokee 235 ZS-DUE. He logged many hours in her flying alongside Old Piet.

He clambered into the back and was finally successful.

Now, those of you who have flown Piper aircraft will remember that they have a storm window only on the left hand side. This meant that in order to dispose of it, the plastic bag of yellow liquid had to be passed in front of the pilot's face and pushed out through an opening a little bigger than the palm of your hand.

It is not recorded exactly how the floppiness of the bag, combined with the rushing of wind, conspired to distribute the entire contents of the pouch on Mr Piet's face and shirtfront – but that's what happened.

When they landed at Wonderboom an hour later, Old Piet emerged from the aircraft wiping his face and his upper body with his battered brown hat.

"Zingi," he said, "last week ve employed zis bastard Rozerro, and today he pisses all over me. I sink I prefer to fly with zat moron Davis."

Thus my job was once again secure – at least until my next misdemeanour.

Flying High

What are the secrets to running a successful aero club? Talking to aero clubs around the country, **Tim Wakeman** discovers that whilst success comes in many guises, there are some common themes your club would do well to learn from.

It's a perfect Saturday afternoon for flying, and Kyneton Aero Club is hosting it's monthly Gourmet Hot Dog Fly-in. The fine weather has attracted a large contingent of aviation enthusiasts from aero clubs far and wide. They gather ostensibly to indulge in the fine lunchtime fare and raise money for neuroscience research, but in reality they pore over each other's aircraft and indulge in a generous dose of hanger talk. In this one month alone the club will raise nearly $500 for the Royal Melbourne Hospital Neuroscience Foundation.

Last year Kyneton Aero Club (KAC) was awarded Aero Club of the Year by the Royal Aeronautical Society and *Australian Flying*. Club Secretary Peter Murphy is rightfully proud of what the club has achieved. "There are many people that don't know the aero club is here, so in the last few years we've been promoting the place. Today you've seen an example of people coming from Albury, Moama, Moorabbin, Lethbridge ... all over the place, and that's just through advertising and through the aero club newsletters."

What does it take for a club like Kyneton to achieve success? The answer to that question lies in having a clarity of purpose, maintaining a singular focus on what you're setting out to achieve, applying some sound management, and maintaining an underlying passion for aviation.

Flight training

It would be safe to say that most aero clubs today have some form of flying training operation, but how important is that to the success of the club? For Redcliffe Aero Club, it has come to define who they are and what they are about. The commitment of the club to flying training is strongly evident and forms the foundations of the club's strength. As Club Chief Executive Stephen White puts it "Without doubt the majority of our income comes from flying training, but ultimately we're an aero club and we never lose sight of that."

Peter Murphy puts the case for flying training operations more directly. "Flying training is an actual requirement for us. Without the students coming in, the club is going to die and through our flying training we're bringing in new students and younger people."

REDCLIFFE AERO CLUB

MAIN IMAGE: Access to the latest aircraft is an important part of an aero club's success.

LEFT: Sharing a love of aviation is an integral part of being in Redcliffe Aero Club.

BELOW: Even smaller aero clubs like Frogs Hollow need to understand the fundamentals of success.

Jack Vevers, President of Peninsula Aero Club (PAC) at Tyabb in Victoria, agrees; not only for attracting new members, but also for enhancing the skills of existing members. "Having a flying training operation is the bedrock of attracting new people into the industry and one of those components that's important in maintaining the health of the club.

"But we also need to make that attractive to existing members and so we've introduced a range of training options for existing members."

It's that focus on building airmanship that is one benefit of being part of an aero club. Andrew Jordon, President of the Aero Club of Southern Tasmania (ACST), says that whilst the club doesn't have a flying training operation, they've formed a very strong alliance with the local flying school to the benefit of members. "We hold a flying activity every second week. It's about promoting improvements in aircraft handling skills, improvements in airmanship, increasing the confidence of the pilots, and most importantly increasing the safety of our flying operations."

And the results speak for themselves. "For this current season the instructors have noticed a significant improvement in the flying skills of all of the members taking part," Jordan observes. "That gives me considerable satisfaction as a pilot and significant confidence as a president that the standard of flying operations are improving."

Remember the stakeholders

One of the hallmarks of successful clubs is their focus on building and maintaining relationships, both within the aviation community but also with the broader community.

At PAC, it's an area of focus for Jack Vevers. "I personally spend a lot of time managing the relationships with the local shire, with the state government, and often CASA and others to make sure that those relationships are healthy, that they understand where we're going and understand how we're going to do things."

For ACST, establishing collaborative relationships with those that may have an impact on the future of the club is imperative. "We have a very positive and close relationship with the owners and operators of the airport," Jordan stresses. "They support us extremely well with all the infrastructure and things we need to support our activities in its current form".

"It's that focus on building airmanship that is one benefit of being part of an aero club."

KAC agrees on the importance of stakeholders in securing the future. As Peter Murphy observes "community engagement is important because like all airports and aero clubs we're fighting for our very existence."

Vevers adds: "It's about making yourself relevant to the community, making sure that what you do is sustainable, making sure that you understand where you're going, having your finger on the pulse when it's not going right, and putting in place some corrective action."

Locality

One factor seen as key to success for many clubs is their location – specifically proximity to major metropolitan centres.

That's certainly the case for Redcliffe. As president Mike Cahill points out "Our proximity to Brisbane is definitely a factor – it would be difficult for an aero club to survive away from a metropolitan centre."

"Location is critical to the success of our club," Jordan says. "This is one of only two airfields in Southern Tasmania that are

STEVE HITCHEN

LEFT: An ACST C172 competing in a spot landing competition.

BELOW LEFT: Good food and healthy dose of hanger talk is what its all about

"We all get a lot of pride out of seeing these kids develop and go on."

regularly occupied and regularly used, it's within easy commute for most people that live in the Hobart metropolitan area."

PAC is another club that benefits greatly from its location. According to Vevers that's an important factor in attracting members to the club.

"Geographically we're good," he believes. "We've got new freeways now that allow shorter commute times for people coming down from the suburbs of Melbourne, so it's a relatively short trip".

Geography is an important factor for Kyneton but for entirely different reasons. "We're right at the point where we're a perfect diversion airport for people getting weather problems," Murphy points out. "We're just north of the Great Dividing Range. Consequently, if there's any sort of a southerly bringing low cloud over the Melbourne area we're in blue sky. And that's frequently an advantage for people flying south – if they can't get any further because of controlled airspace and terrain, they can stop here."

Finding and keeping

Clearly the ongoing viability of any club relies on its ability to attract and retain members and that is a constant area of struggle and focus for aero clubs big and small.

Perhaps one of the more sophisticated in this regard is PAC. According to Jack Vevers it's all about planning and execution. "There's obviously been a decline in GA since 2007 and we've swum against the tide to try and attract members. One of the cornerstones of our success is that we spend a lot of time on the planning phase. We have a strategy of where we want to be and how we want to do it, and also a plan.

"That's really the backbone of trying to meet challenges, is the planning process, sense-checking that, and making sure that it works." PAC is also successfully attracting younger people into the club. "We have a number of school programmes in place where we train kids from schools and we teach them to fly", says Vevers "and we've seen a bunch of kids go through that programme and go on to become commercial pilots. We all get a lot of pride out of seeing these kids develop and go on."

For ACST, a focus on members has been an area of continuing focus for the committee. According to club Secretary Peter d'Pleese, "This club has had a strong focus on members and one of our strengths is actually the relationships between those members. That encourages interaction in the clubhouse and around the bar and it does lead to more flying activity. So that's an intangible but very important strength that we have."

Somewhere to be

Whilst these factors rank high on the list for aero clubs, surprisingly, facilities and infrastructure are seen as somewhat less important.

For Redcliffe, the investment made in infrastructure and facilities is about maintaining the foundations of the club: flying training operations. Mike Cahill outlines the club's philosophy.

"Facilities are important, but what is more important to us is the quality of the aircraft fleet. At Redcliffe we have very recent models of aircraft and have recently acquired a simulator. A significant proportion of the profits from the operation of the club go into investment in aircraft."

As part of its focus on supporting the community, PAC has made an investment in facilities and infrastructure that is paying tangible dividends to the broader community. Last year the club invested in a new helipad and jet fuel facility, which is now used regularly by police and emergency services as an alternate landing and refueling point. In the short time the facility has been in operation it has proven instrumental in saving lives.

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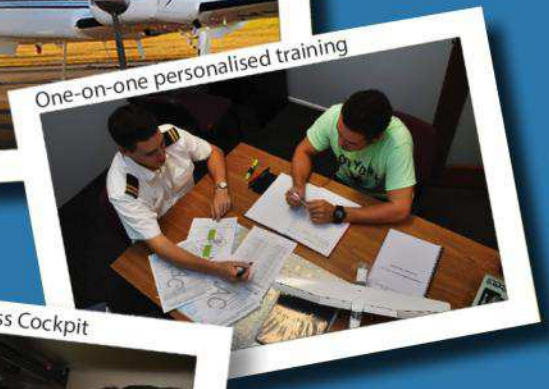

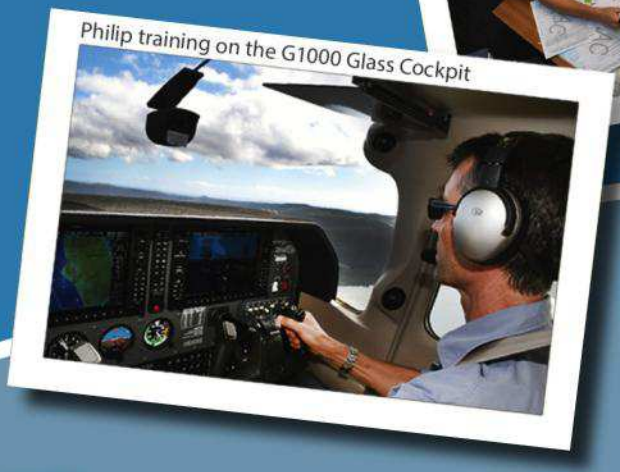

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ABOVE: A line-up of visitors to another Kyneton Aero Club event.

RIGHT: The clubhouse is the central hub of the aero club – a place to meet, talk, learn and share.

Commercially savvy

Many aero clubs today are just as much a business as they are an aero club. So being commercially savvy is important in maintaining the financial health and viability of the club.

"Being commercial savvy is really important," Vevers says. "You can't forget that this is still a club but you need to treat it as a business. It has a significant turnover, it needs to be properly managed, and we need to have proper tools in place and attract people onto the committee that have the skills that we need to run the club. If you don't have the right management behind it and the support of the members you would quickly run aground."

Running the aero club commercially is key to the success of Redcliffe too; so much so that they've appointed a Chief Executive Officer to focus on the commercial aspects alongside a CFI to focus on the operational aspects. As Mike Cahill points out "For the size of our operation here it is simply too hard for this to be one person."

Being a part

So what's the value to members of being part of an aero club? Jack Vevers is quick to respond. "An aero club is not just a place to keep your plane – there's this whole social interactivity that we have and also the engagement we have with the community that makes the flying experience more fun than just being on your own. You get to do it with some camaraderie and people with like interest. We genuinely like to make people feel welcome and part of the whole programme."

For Peter Murphy, being part of an aero club has a number of pluses. "There's camaraderie – everybody can learn from other people's stories and other people's mistakes. I think our costs per annum are quite cheap compared to larger airports and our rates for storing aircraft here are quite cheap."

Diversity is another factor fundamentally important to building a healthy aviation community.

"The more exposure that you have to diversity the more appreciation you have for what the world has to offer," Vevers reckons. "We've got people with enormous experience, from all walks of life and all walks of aviation. There's so much diversity that I've seen some people when they've joined transitioning from what they would have been doing on their own to engaging in other forms of aviation and discovering a whole new world for themselves."

According to Peter d'Pleese, currency and proficiency are also important reason for being part of an aero club. "Membership provides access to an aircraft at an attractive rate, and on top of that through our flying activities we can offer a cheap and very effective way of maintaining currency.

When a pilot is current they are more confident and therefore more inclined to go flying."

Giving back

A common theme amongst aero clubs is a sense of their role in the broader community and a focus on giving back to the community. In the case of Redcliffe, that has been enshrined into their constitution making their commitment to giving back a continuing area of focus for them.

At PAC, the focus on giving back to the community is palpable. Jack Vevers explains the club's approach.

"We have a programme that we set for the coming year about what we are going to do to engage the community,: he says. "We're just making sure that we're dialed into the community, that we're a force for good and that we give back more than we take out of the community."

KAC's Peter Murphy agrees. "We've tried extremely hard to be community-minded. So this gourmet hot dog day is one of the fund raisers that we've run. Australia's Biggest Morning Tea has been very successful over the years raising over $35,000, we hold open days here at the airport and get some of the local clubs and service clubs involved in that, and all the profit from our airshow last year went back to Rotary. So it's all going back into the community."

Andrew Jordon sets out a simple yet eloquent case for the role that aero clubs play in the community. "The thing that clubs do is not only engage with the local community and foster an interest in aviation, but we also provide those in the local community with facilities to actually turn that interest into something active."

Putting it all together

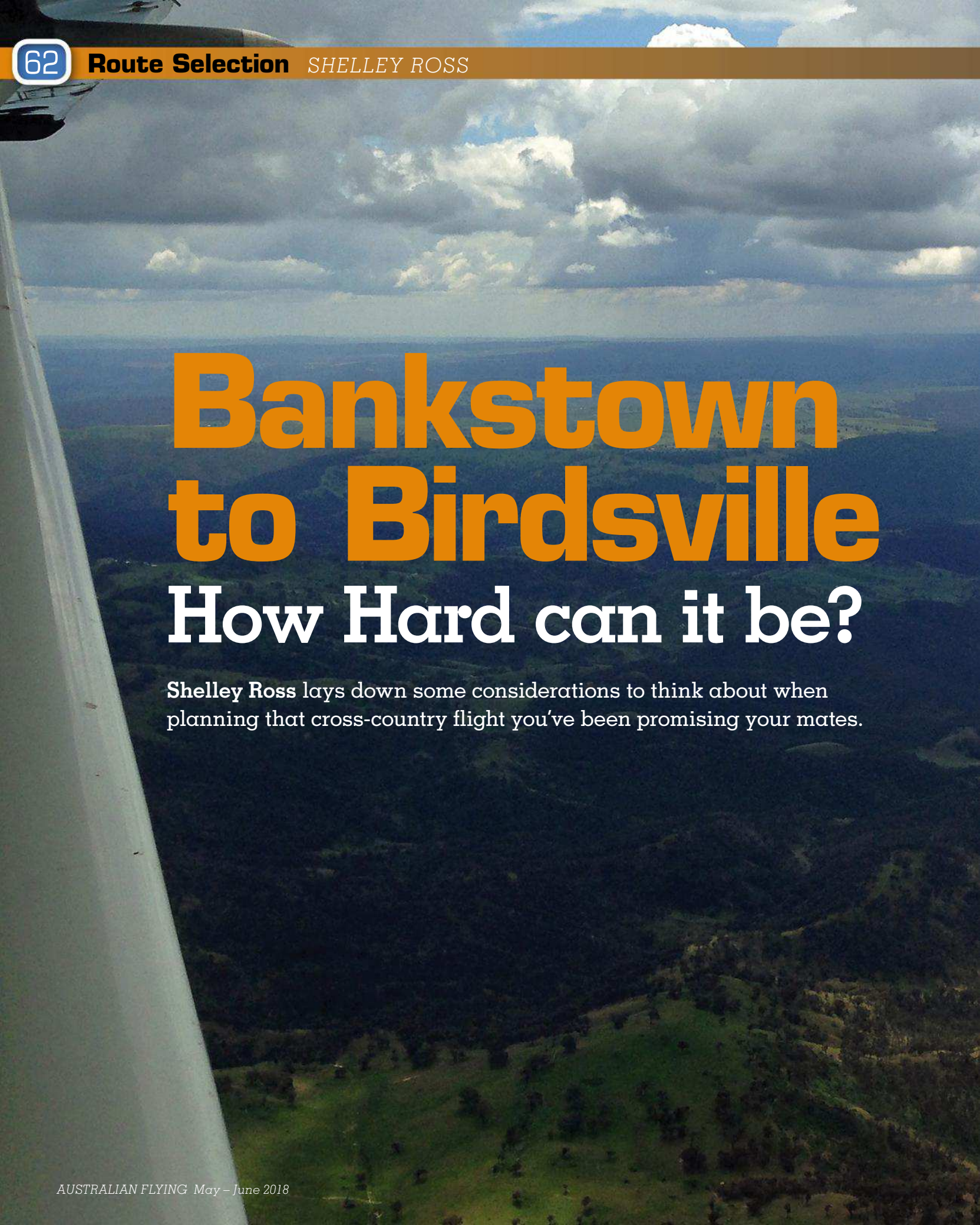
Andrew Jordon has a simple formula for success. "Establish collaborative relationships with all of the people and organisations

that may have an impact on your future, keep your members engaged and informed, keep your costs low, make sure you have good aircraft and facilities, and keep your membership numbers up."

Jack Vevers is justifiably proud of what PAC has achieved. His advice is clear: it's all about strategy and planning. "In real terms I think it's about developing good strategies and good plans. That's the acid test for any organization, to make sure these things are viable and real. If you fail to plan, you plan to fail."

For Redcliffe, their keys to success are clear according to Mike Cahill. "The key measures of our success are maintaining a quality aero club, quality facilities, quality aircraft, the highest standards of safety and regulatory compliance, and commercially profitable."

Jack Vevers perhaps sums it up best. "My personal philosophy is that if we stand still we're dead, so we need to continually improve, reinvest and build the club."



Bankstown to Birdsville

How Hard can it be?

Shelley Ross lays down some considerations to think about when planning that cross-country flight you've been promising your mates.

There's something pretty wonderful about getting to a stage in your flying when you feel confident enough to venture outside your familiar training area and set off cross-country with friends onboard. Now that you have your licence and are blissfully untethered from your instructor, you get to choose where you fly – happy days!

I don't think I've ever come across a situation where the planning hasn't taken longer than the actual trip. The success of a cross country flight is hands-down directly proportionate with the amount of thought you give to some vital components.

If you've learnt anything about me over the past 19 years, it's that I do not like working once the sun goes down. If I've just arrived at a new destination after a long day in the 182 cockpit, why on earth would I want to then have to drag out the maps and labour over what's on the agenda tomorrow? Seriously? There are people to meet and tall tales to tell. So, let's get the work done before we leave home. There'll be enough to fill your plate en route without having to sweat the basic stuff.

Managing the legs

Planning a cross-country flight doesn't mean you can assume a direct A to B line. There are so many ifs and buts to consider, you need to start the thinking process with an open mind. Let's look at a flight from Sydney's Bankstown airport to Birdsville. What sort of considerations do I need to take into account to work out whether this trip is going to be viable, and which route to take?

The list is pretty extensive. Elements like aircraft performance, pilot experience, terrain, weather and fuel availability are just the tip of the iceberg.

A straight line on OzRunways tells me Bankstown to Birdsville is a distance of 773 nm. So what are we flying – a Drifter or a C210? Let's choose something in the middle, say a C172.

One trick I've learnt with safari planning is to straight-away look at the mileage of each leg and divide it by 100 to work out your time. I'd look at 300 nm and say, ballpark time needed for that flight is three hours. Don't get that look on your face; I said *ballpark*! My type of flying is almost always in a fleet, big or small, but by the time we all get pax organised, find the keys, taxi, divert a little for the knockout scenery slightly off course, join the circuit without hitting something at the other end, land and tie down – it's not far off an hour for every 100 nm.

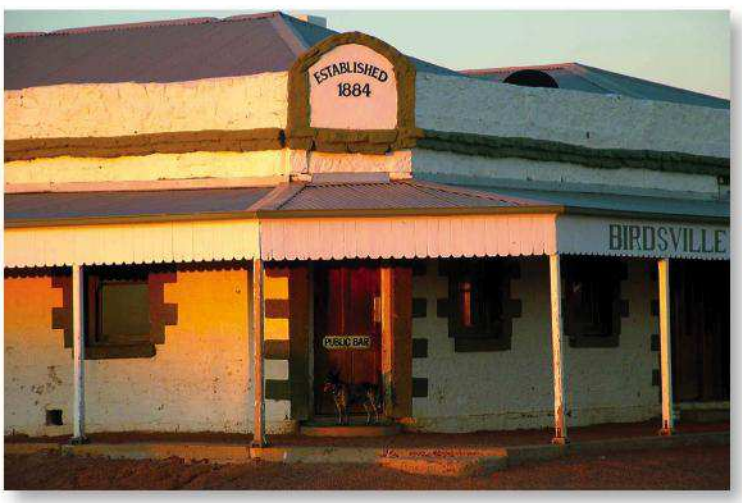
On that note, it's common sense to be conservative in your estimates. There's nothing worse for the pick-up person at the far end to be sitting waiting in the hot car at the strip, willing the first of your aircraft to appear

Low cloud forecast over the Blue Mountains needs your careful attention.

TOP: Used with care, and attention to power settings on the ground, bush strips need not present any concern.

ABOVE: Tracking via en route airports can give you options if you have to land unexpectedly.

RIGHT: So when all the work is done, and you make it happily to your destination, you know where to find your reward.



over the horizon, because you've given them a time you haven't been able to keep to. That's just plain rude. I'd much rather have plenty of time to park, tie down and have bags ready. Actually, the Bose bluetooth headset gets a fair workout from me en route, calling our hosts with ETA updates. It's not all about us; these people are busy.

Aircraft

OK, off my soap box. You and your steed are going to become very close by the end of this adventure. Ask yourself some questions about the aircraft you plan to take away:

- Am I absolutely current on this one?
- Do I trust the engine & airframe maintenance?
- Does it have enough hours left for my jaunt before its next 100 hourly?
- Do I need to take any spare parts?
- Will it suit all the airstrips I'm planning to land at? Spats on or off?
- What oil consumption should I expect?
- I'm taking more passengers than I'm used to. Have I done a load check?

Endurance

Let's think about endurance – aircraft and human. We need to break up this 773 nm into a few achievable legs. Achievable means comfortable. Your passengers won't thank you for back-to-back three or four hour stints in the air without the ability to do star jumps in the corridor on their way to the loo. Try and keep each leg a reasonable time. A stop to stretch your legs does not have to take long.

As far as refuelling options go, on this particular route, we have plenty of choices. If you keep a fairly straight line, there's Narromine, Coonamble, Cobar, White Cliffs, Bourke, Tibooburra, Innamincka (drum) and Thargomindah. The considerations are whether these places take us off track, whether there are any NOTAMs

"taking off early and getting the flying done by lunch time makes so much sense."

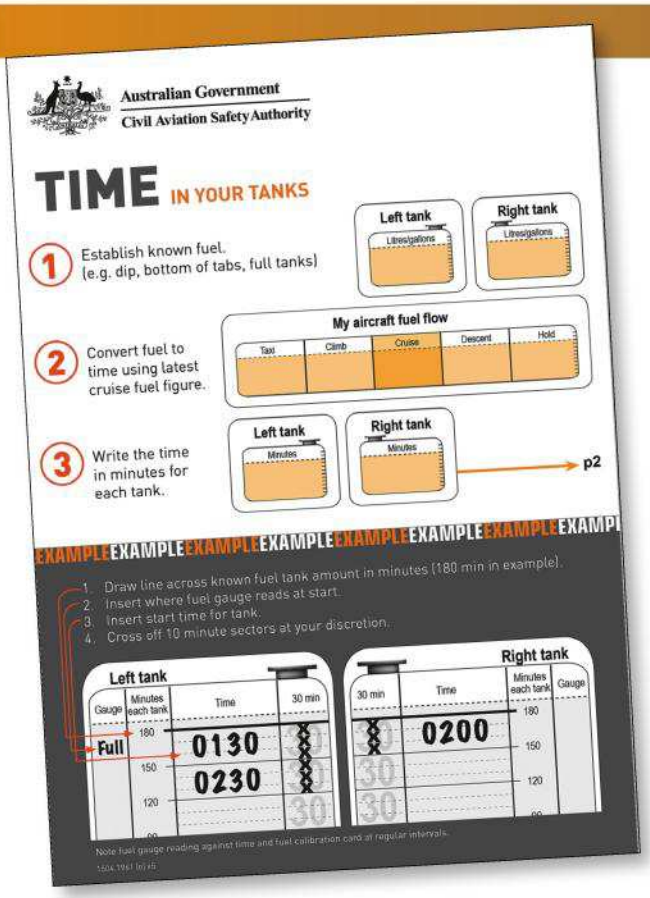
out about landing there, how expensive and reliable the fuel supply is, and whether you want to combine a fuel stop with overnight accommodation.

It would be a different story if you were planning through some uncrowded WACs like the stretch from, say, Halls Creek to Ceduna. Here is where endurance, wind conditions and fuel supplies take top place on the podium of route considerations.

I harp on and on about always ringing the refueller at each possible stop before you leave home, checking availability and method of payment. A couple of blokes in a microlight pulled up behind me at the Mildura bowser once, surprised and dismayed with the requirement for a World Fuel Services card. Obviously they borrowed mine but otherwise, dry argument, boys. Ever heard of the ERSA? Mind you, I'm currently boycotting that place entirely since they've turfed GA out onto a crook old piece of gravelly dirt to park on. Don't start me. If it's resolved by the time you're reading this, I'll keel over and faint.

I rang the Mildura Airport Operations Manager, Bill Chapman, who hastened to tell me this was a temporary situation. He told me they were scheduled to start irrigation on one of the gravel GA parking areas in early March, then they'd do the second area,

ABOVE: Big noisy airshow at your planned destination – who knew? Read your NOTAMs.



in a quest to get grass growing as soon as Mother Nature allowed. When I suggested an availability date of the end of April, he was dubious, and thought it more likely by end May. In the meantime, no, we are no longer allowed to use any of the sealed apron area outside the aero club where we've been parking to go grab a coffee for the past decade. If you need to call in, give the Ops Manager a ring re the current situation before you get there.

Terrain and weather

On our first leg out of Bankstown, you'll notice there's a big fat mountain range in our way. This may provide an awesome scenic flight over Katoomba's Three Sisters, or an opportunity for you and your passengers to remould the shape of your head on the roof of the plane. Direction and strength of wind should be high on your list of must-watch elements. Low cloud is another, so dedicate some time at home to working out an alternative route that takes you over lower terrain if you need to.

Think also about flying into the afternoon sun as you travel west. You're heading out into the hottest part of Australia; taking off early and getting the flying done by lunch time makes so much sense.

Airstrip

A huge consideration on any trip is going to be your choice of landing strips. If you want to break out and fly into some bush strips, then both you and your aircraft need to be up to the task. Don't go selecting the 450 m grass strip on the side of the hill attached to the fabulously rustic B&B if you haven't visited a P-chart since your last theory exam. And that dirt strip on the station you've chosen as your overnight stopover won't look so inviting after a night of rain, so keep a plan B up your sleeve in

that situation. The main thing is to match your plan with your capabilities.

When you are choosing your route, also make sure you consider the "what ifs". What if one of your passengers falls suddenly ill and

"Direction and strength of wind should be high on your list of must-watch elements"

you have to land at an unplanned airfield? What if the weather ahead is not looking anything like as good as this morning's forecast? What if you run out of noise up there and need to carry out a forced landing? Have a look at the terrain and what airports are along your planned track.

For example, say you're planning Lilydale to Merimbula. The direct track offers only two decent intermediate airports within cooee of track: Delegate and Bombala and they're nearly at the destination. There's some pretty high ground en route, so maybe you should consider tracking via Mount Hotham instead? Now have a look at the coastal route. Sure, it's longer, but suddenly you've got Latrobe Valley, Bairnsdale, Lakes Entrance, Orbost and Mallacoota all close to your route. For the added safety element, the coastal route wins my vote hands down.

So, sweat all the small stuff before you leave home. Once you're on your way, you will have daily weather conditions to consider, which may entail unexpected diversions, who knows? You want head space to take care of anything that arises,

to ensure the safety of you and your passengers. Go for it, there's nothing more rewarding than completing a long distance flight where all your planning has left precious little to worry about and you can soak up this gorgeous country of ours from the best seat in the house.

ABOVE: You may well have a full load on this adventure – swat up on your performance charts before you leave home.

LEFT: Fuel management is a vital component of any cross country flight.

Down to business

PHILIP SMART

DASSAULT

Dassault announces the 6X

Philip Smart *presents inside information from the business and corporate aviation sector.*

Dassault Aviation is nothing if not pragmatic. In December the French business jet manufacturer announced cancelation of its 5X widebody twin, largely through continued delays to the Snecma (now SAFRAN) Silvercrest turbo-fan engine chosen to power it.

Now Dassault has taken much of the aerodynamics and systems design validated through the preliminary 5X flight test program and launched a longer (in both range and cabin length) 6X.

With a maximum take-off weight of around 35 tonnes, the 6X will be powered by Pratt & Whitney Canada PW812D engines in the 13,000 to 14,000 pound thrust class, the core of which has already flown nearly 600,000 hours in 16 engine applications including those powering the Airbus A320neo, Bombardier CSeries, and Gulfstream 500 and 600.

The 6X is scheduled to fly in early 2021, with first deliveries expected the following year. It will have a range of around 5500 nautical miles at M0.8 (more than 10,000 km, or Los Angeles to London), or 5100 nm at Mach 0.85.

Dassault's business aircraft have a reputation as pilot's aeroplanes, with handling and ergonomics to match. Dassault claims the 6X cockpit has more headroom than any other aircraft and 30% more window space for greater situational awareness in the air and on the ground. The wider cockpit allows entry and egress without having to climb across the centre console.

The 6X will feature Dassault's Falcon Eye head-up vision system, an option on the larger 8X but standard on the newcomer, that overlays a synthetic picture generated from terrain, obstacle and navigation databases with a picture from six different sensors on the aircraft, including a thermal sensor for terrain imaging and another which can detect LED runway lighting before the naked eye can see it. Such is the system's accuracy and clarity, it is expected it will eventually provide operational credits for bad weather approaches with 100 ft minimums, providing operators with a substantial operational benefit.

The aircraft will also be equipped with a digital flight control system managing every flight control surface including slats and flaps, including Dassault's new dual-purpose "flaperon" flap and aileron control surface, which Dassault says improves control on approach, particularly on steeper profiles.

With eight passengers and three crew, the 6X is expected to have a Vref approach speed of around 109 knots at sea level.

Behind the cockpit up to 16 passengers will probably be as happy as the flight deck crew, with a cabin nearly two metres tall and 2.5 metres wide, stretching for 12.3 metres. With long-range flight the goal, Dassault makes much of the 6X's flexibility, with the interior configurable with three separate seating areas, with options such as a large entry way/crew rest area and a spacious rear lounge. The company has gone big on natural light, including 29 windows and an overhead skylight above the galley, a spot normally

only lit artificially. Dassault has also fed experience with the larger 8X in to the 6X's noise suppression system.

"The industry has been moving towards ever wider and higher interiors and customers told us what they wanted most in our new Falcons was more space," said Eric Trappier, Chairman and CEO of Dassault Aviation. "The Falcon 6X will offer a mix of range, comfort and capability no other large cabin business jet can match while guaranteeing fully mature systems and a proven powerplant."

Thirty Years on Ice

The Australian Antarctic Program is celebrating a decade of flights to the frozen continent's blue-ice runway, improving access for hundreds of scientists and expeditioners.

A total of 131 flights carrying more than 1600 people have landed at Wilkins Aerodrome since it officially opened on 10 January 2008.

Australian Antarctic Division Acting Aviation Manager, Steve Wall, said over the past 10 years the majority of flights have departed from Hobart, the gateway to East Antarctica.

"Where the ship takes weeks, Wilkins Aerodrome gives us the ability to fly expeditioners and equipment between Australia and Antarctica in just over four hours."

An Airbus A319 and Royal Australian Air Force Boeing C-17A Globemaster III are used for the flights, landing on the glacial runway which moves about 12 metres each year.

Equipped with long-range fuel tanks, the Airbus A319-115LR has a range of 5000 nautical miles, providing the ability to fly Hobart–Antarctica and return without refuelling, a total of almost 4000 km.

"We fly between October and March each year and have a team living onsite who prepare the runway using snow groomers, graders and snow blowers," Mr Wall said.

"They're also trained as weather observers to monitor the often changing conditions on flight days."

The A319 carries up to 38 expeditioners on each flight. Passenger numbers depend on the requirement of the program. Normally the aircraft carries up to 20 passengers but has a surge capacity of 40.

The intercontinental air transport is designed to move approximately 400 passengers each summer season and a limited amount of high priority, lightweight cargo (current maximum of 1500 kg per flight).

"When they land, the passengers either travel 70 km overland to Australia's Casey research station, or make a connecting intra-continental flight to another Antarctic station."

The Royal Australian Air Force and Australian Antarctic Division started joint operational missions with a C-17A in 2015.

"The C-17A has flown 19 missions to Wilkins Aerodrome, transporting large cargo such as helicopters, over-snow vehicles known as a Hägglunds, and a 23 tonne tractor to the continent."

Wilkins Aerodrome operates as a certified aerodrome in accordance with Civil Aviation Safety Authority regulations.

The aerodrome is named after Sir Hubert Wilkins, the first person to fly over Antarctica in 1928.

> **Wilkins Aerodrome gives us the ability to fly expeditioners and equipment between Australia and Antarctica in just over four hours.**

NSF Gulfstream studies Southern Ocean Cloud

The US National Science Foundation's highly modified Gulfstream V research aircraft has operated out of Tasmania over the Australian summer on a project to understand and model Southern Ocean clouds for climate and weather forecasts.

The NSF Gulfstream-V High-performance Instrumented Airborne Platform for Environmental Research (GV HIAPER) is a modified GV that can fly at more than 51,000 feet, with a range of more than 11,000 km. While owned by the National Science Foundation, it is operated by the US National Centre for Atmospheric Research (NCAR).

It can carry more than two tonnes of sensors and collect data at the tops of storms and lower edge of the stratosphere, altitudes out of reach of most research aircraft.

The aircraft was programmed for 16 flights over a six-week period from mid January in a combined exercise that also saw Antarctic supply vessel *Aurora Australis* sailing with more than seven tonnes of atmospheric instruments to monitor clouds and aerosols and a cloud LIDAR, which uses laser pulses to measure light scattered off cloud water droplets or ice particles.

The system was designed to provide information about the composition and height of the clouds, while a cloud radar and microwave radiometer gathered data on cloud thickness, height and their liquid and ice water content.

A micro rain radar and a specialised marine precipitation sensor measured precipitation over the oceans, while avoiding contamination from sea spray.

Similar instruments were carried by the CSIRO's RV Investigator at ice-free Southern Ocean latitudes for six weeks in early 2018.

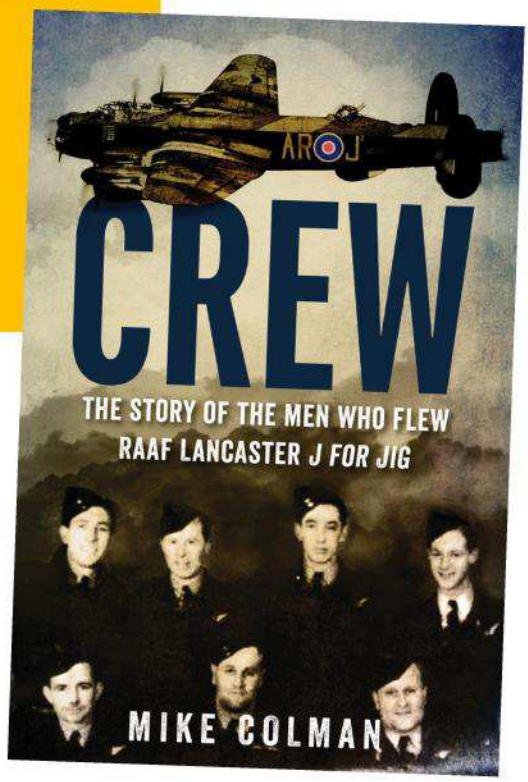
MICKY LOEDERMAN / AUSTRALIAN ANTARCTIC DIVISION

MAIN: The Falcon 6X is predicted to have a range around 5500 nm.
BELOW: A Boeing 319 at Wilkins Aerodrome in Antarctica.

Products & innovation

The Lancaster of Villiers-sous-Prény

Four headstones in a French churchyard tell only part of the story of one RAAF Lancaster crew. A new book now tells the rest.



In the midst of the Alsace-Lorraine region of France sits the peaceful village of Villiers-sous-Prény. Like many other such communities in Europe, its spiritual centre is the church, and by extension, its graveyard. Headstones in the yard tell the histories of the people going back over 200 years, but it is four graves sitting separate near one corner of the sandstone church that make Villiers-sous-Prény unique.

They tell the story of one night in 1944 when four young men perished as they fell to earth over the town, but they also tell the story of an entire village that defied the occupying Germans to ensure the men were properly buried. It was a rite that was not afforded to thousands of other Bomber Command airmen that died over Europe in the Second World War.

The graves are of Australians Ron Ferguson and Cliff Hopgood, and Scotsmen "Jock" Dunlop and Peter Mallon. They were four of the crew of seven aboard 460 Sqn RAAF Lancaster *J for Jig* that was lost on 24 February 1944, when a Bf110 playing *schrage musik* sent the bomber spinning to the ground, a mass of burning wreckage. The other three on *J for Jig* survived; one going into captivity and two taking perilous paths through occupied territory until they reached the relative sanctuary of neutral Switzerland.

Now, a new book, *Crew* by Mike Coleman, knits together the individual stories of each man, telling how that night was in some way devastating to each one of them and their families, and recounting the impact it had on the French people living in Villiers-sous-Prény.

Coleman starts out by introducing each of crew of *J for Jig*—what they did, who they loved, who loved them, who they left behind—and traces the paths each one took that brought them together that night. It follows the men through training in Australia, Canada and the UK to the process of "crewing up" that formed one team destined to fly and fight together. A Bomber Command crew was each other's everything; they would go to war as unit, fighting for each other as much as they were for their country.

As well as those lost on *J for Jig*, the book acquaints users with the pilot, Wonthaggi boy Dave Baxter, who tragically lost his father in the State Coal Mine tragedy in 1931; bomb aimer Tony D'Arcey, whose father was a WWI POW and mid-upper gunner Bill Martin, the boy from Darlinghurst.

Parachutes saved the lives of these three, although Martin was badly injured, leaving the people of Villiers-sous-Prény to take the heart-breaking decision to hand him over to the Germans to give him a chance of survival. Survive he did, but was condemned to the horrors of the German POW system, which would slowly collapse under the pressure of war and lead to desperation and hunger.

Baxter and D'Arcey used their street smarts and the help of courageous locals to evade capture, to spend months interned in Switzerland where being a prisoner meant being paid and time in mountain resorts. Although they were separated, pilot and bomb aimer were reunited at one such resort, but the desire to get back into the fight, and the lack of knowledge of the fate of the rest of the crew, drove them to conspire to escape Switzerland, made easier by the Allied landings in the south of France. The tale of their trip home would make a book all of its own.

Coleman's book is a narrative both dramatic and haunting, with reminiscences from other former Bomber Command crew to set the environment in which the *J for Jig* crew worked. From the training, the partying, the fear, destruction and death that crews worked with every day, *Crew* has captured the essence of what it meant to fly Lancasters into the maelstrom over Germany nearly every day.

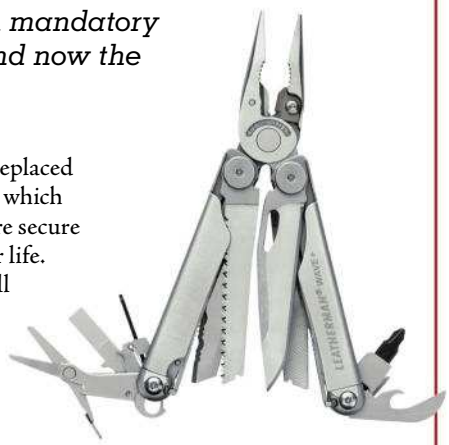
And it goes further, paying tribute to the determination and courage of the people of Villiers-sous-Prény, who, in direct contravention of German orders, held a 6000-strong funeral for the four airmen killed. Yes, they wanted to pay their respects, but it was also a time to remind their occupiers whose side they were on.

Ostensibly, *Crew* is the story of the seven men on *J for Jig*, but if you read deeper into the pages, it also stands as a testament to the thousands of airmen who went through the same deprivations as these men did, and the thousands whose own stories remain untold.

Crew by Mike Coleman
RRP: $32.99
Allen and Unwin
www.allenandunwin.com.au

Leatherman Wave+ 2018

Leatherman tools have almost been mandatory around airport hangars for years, and now the 2018 Wave+ looks to deliver more.



Also known as the pilot's friend, the iconic Leatherman Wave+ multi tool has been significantly upgraded for 2018.

The Leatherman Wave+ has been the saviour of many a stranded aviator over the years, providing a handy tool to resolve annoying pilot maintenance issues.

Now, the 2018 version is packing even more into the very compact space it occupies, including a newly designed set of pliers that incorporate removable and replaceable wirecutters.

Additionally, the new Wave+ will come with an improved sheath, redesigned from the ground up for longer life. It's Velcro closure has been replaced with a metal snap which will provide a more secure closure and longer life.

The Wave+ will be available in two different colours: stainless and black.

Among the 17 tools contained in the Leatherman Wave+ are those that can perform more mundane task like tightening screws, filing metal bits, crimping wires and opening bottles (for after tie-down) to the more exotic, such as a beard trimmer and christmas tree cutter (good for clearing a bush runway).

With the blades on the outside deployable with only one hand, it's no wonder there have been over 10 million sold since 1998.

The Wave+ is only 100 mm long when folded and weighs in at only 241 gm.

Wave+ by Leatherman
RRP: $219.95
www.leatherman.com.au

Casio's New Gravitymaster

Casio's GA1100-1A1 is a lot of aviation watch without the killer price tag.

Watchmaker Casio has introduced the latest addition to their Gravitymaster series of timepieces that are developed specifically for aviation.

The GA1100-1A1 features a new type of World Time function that is designed with international pilots in mind. In addition to the time in your current location, which is indicated by wide hour and minute hands, a second time can be displayed by a dial at 9 o'clock.

Other functions include a large button that can trigger a 60-second continuous bearing or temperature sensor reading with a single press, a digital compass with a hand indication of north and the direction displayed as one of 16 points, and a thermometer with a – 10 to 60°C range.

Within the GA1100 is a world time function that will cover 31 time zones, has five daily alarms, an hourly time signal and can be set to either 12- or 24-hour time formats.

A high-luminosity LED display light makes the information easy to read even in the dark.

The GA1100 incorporates a resin base with a stainless steel bezel, resin band and mineral glass. It runs on two SR927W batteries that have a two-year lifespan approximately. The case is 50.8 x 52 x 17 mm and weighs in at only 88 g.

This is a very stylish watch with plenty of aviation-specific functionality, and it's priced so that it won't drain your flying account.

Casio Gravitymaster
GA1100-1A1
RRP: $549.00
gshock.shriro.com.au

Rotors

NVGs make Victorian Night Fire-fighting Debut

Greg Thom *presents news and views from the Australian helicopter industry.*

Two Victorian regional airports will be the focus for an innovative aerial fire-fighting trial using night vision goggles (NVGs) to fight bushfires at night. A first for Australia, the trial, known as Night Fire Suppression Operations (NFSO), will see Emergency Management Victoria (EMV) lead a multi-agency group including the Department of Environment, Land, Water and Planning, (DELWP), Country Fire Authority (CFA), National Aerial Firefighting Centre (NAFFC), Coulson Aviation (Australia) and Kestrel Aviation. The trial has been approved by the Civil Aviation Safety Authority (CASA).

"While night vision aircraft operations have been permitted for many years, under the safety regulations, using this technology in fire-fighting is a new challenge," a CASA spokesman said, "and a lot of work has been done by CASA's experts to ensure the appropriate safety standards are met while giving fire-fighting aircraft the ability to work at night."

Emergency Management Commissioner Craig Lapsley said night-time aerial firebombing had the potential to significantly improve Victoria's fire-fighting capability, better protect life and property and significant infrastructure during major bushfires by continuing the work that would be done during the day to contain fires.

"Fighting fires in the dark hours, in the cooler part of the night or in the early parts of the morning would enable us to get on top of fires quicker, particularly those in remote parts of Victoria where access may be difficult," he said.

Coulson and Kestrel are the two operators who have been approved by EMV and CASA to conduct the trials, which will test the ability to hover-fill helicopters at night and also the efficiency of night vision technology, including infra-red systems.

Mangalore-based Kestrel Helicopters will use Bell 412HP, VH-KHU "Helitack 346" which is fitted with a Conair 85-KE fire retardant delivery system. Having completed the first two low-level phases, the final phase will involve EMV and CASA to get their final approval. Managing Director, Ray Cronin said "Kestrel is combining its industry-leading helicopter pilot skills with innovative technology to drop water and suppressants on fires in all conditions at night. These low-level, night time deployments of water from Kestrel's advanced helicopter belly tank are the first to deliver with considerable accuracy in Australia.

"We anticipate receiving approval to go 'live', being ready to fight frontline bushfires at night, by the end of March. Night firebombing operations are already conducted offshore, and Australians can have confidence that specialist companies such as Kestrel are doing everything to stay abreast of international capabilities in fire suppression." he added.

Based at Ballarat, Coulson will supply two machines, a Sikorsky S-61N with a 4000 litre tank, C-FIRX "Helitack 347" and a Sikorsky S-76B intelligence platform, C-FIRW "Firebird 322".

"A positive outcome of the trial will allow Coulson to operate unrestricted night fire-fighting operations in Australia and will add to the company's already approved night fire-fighting programs in Canada and the United States." said Coulson Chief Executive officer (CEO) Wayne Coulson.

Both operators anticipate having approval for the capability for the 2018/19 summer fire season.

Becker opens SA Base

Maroochydore-based Becker Helicopters has announced it plans to start an operating base at Whyalla in South Australia's upper Spencer Gulf region within the next 12 months. Becker is Australia's largest civilian helicopter flight training organisation, providing services for overseas military personnel and advanced training including night vision goggle use for emergency services operators. Together with the University of South Australia and TAFE SA, the company is negotiating a training partnership designed to deliver degree-level aviation and aerospace training courses. It is expected at least 50 international students will live in the Whyalla area during the two-year course with planned infrastructure growth to include hangars, hard-standings and administration buildings. The South Australian Government said it will support the establishment of the new base through the Economic Investment Fund.

KESTREL AVIATION

COMMONWEALTH OF AUSTRALIA / CPL MARK DORAN

LEFT: Kestrel's Bell 412HP during night fire-fighting trials.

ABOVE: Captain Adrian Ludman at one of the HATS simulators.

Becker Helicopters CEO Jan Becker said the company is excited to grow its operations. "We are proud that South Australia is going to be home for our major training capabilities and we have been overwhelmed by the support and assistance we have been receiving from the local Whyalla Council and the South Australian government through Defence SA," she said.

First HATS off at Nowra

The first group of students hoping to graduate as future military helicopter aircrew have commenced training at 723 Sqn's Joint Helicopter Aircrew Training School at HMAS Albatross at Nowra. The 37 future pilots, aircrew and Aviation Warfare Officers recently embarked on their respective courses which could last up to 26 weeks. It is intended that the school will train up to 116 students per year over the next 25 years, ahead of their conversion to operational Navy and Army aircraft.

Bruce Willington, Commanding Officer of 723 Squadron, said "The launch of the training school using a 'one team' approach delivered an integrated training system for all rotary wing aircrew. Thales Aerospace full flight simulators will provide a high-fidelity virtual reality environment for students to hone their skills while preparing them for the modern aircraft."

The Helicopter Aircrew Training System (HATS) encompasses flight simulators, winching, aircraft marshalling, aerial transfers to ships and deck operations and a helicopter maintenance program along with the provision of ground and air training by Boeing and Thales.

R66 Wire Protection and Cargo Hook Options

Robinson has added a wire-strike protection system and cargo hook provisions to the options list of its R66 model. The Federal Aviation Authority (FAA) approved bolt-on wire strike protection is by Canada's Magellan Aerospace which adds 7 kg to the empty weight of the helicopter. Structural changes include reinforcement and attach points on the windshield bow, roof, and chin, with low-profile deflectors near the ground handling ball and forward landing gear struts. The system is available as a complete aftermarket kit.

The cargo hook installation carries external loads up to 545 kg and, for external load operations, the R66's maximum gross weight increases from 1225 kg to 1316 kg, with two options available. The basic installation, which includes the cargo hook and right-seat controls allowing operations from the pilot seat only, and the advanced installation which includes the cargo hook, right and left-seat controls, a left-seat hydraulic switch, and a left-seat start button. A load weight gauge and a second set of engine power gauges (torque and gas temperature) are located in the left door sill allowing the pilot to monitor engine operations and the external load. Also included are provisions for remote control of long-line hook or a water dropping bucket. FAA certification for the cargo hook is pending.

In the Right Direction

*RAAus CEO **Michael Linke** reflects on the falling accident rate for recreational aircraft.*

Since 2014, macro change has resulted in dramatic improvements in the accident rate, the financial stability and the governance of RAAus. Some people in industry and at regulatory and policy levels have not had a lot of visibility of these changes and still see RAAus as an aero club from the 1970s.

We are no longer that aero club. RAAus is a professionally governed and managed, important and pivotal part of the future of aviation in Australia.

RAAus is now a company limited by guarantee with seven directors responsible for strategy, policy, oversight and legal compliance. We have implemented an over-arching governance framework which is publicly available on our website.

In terms of financial stability, the Board of Directors and Leadership Team have made significant changes to our business model to create sustainability and ensure RAAus has a bright future. We still run a frugal budget, but structural changes to our resources and service models have aided in creating positive cash flows and a surplus budget.

With regard to our accident rate, some headline figures are quite demonstrative of real improvements. In 2013 our rate of fatal accidents per 100,000 hours was 5. In 2014 this rate had reduced to 2.65. Today the rate runs at just over one fatality per 100,000 hours.

We have also noted the significant increase in hours recorded. Since 2017 RAAus introduced digital reporting of hours (prior to 2017 we relied on paper reports from members) to record hours within our data base. We have greater confidence in this figure than earlier figures as we have captured more member data that in prior years. The under reporting of hours by members prior to 2017, and especially in years earlier than 2014 is a contributing factor to some people's assertions that the RAAus fatality rate is high. This is simply not true. A direct comparison between the fatality rate of RAAus and the GA sector in 2017 would reveal RAAus to be safer.

Furthermore the rolling quarterly fatality rate has dropped from four per quarter in 2014 to less than one per quarter today.

In terms of non-fatal accidents, the chart on p75 shows the number of accidents recorded since 2013-2014 financial year.

The sustained and dramatic improvements in our accident and fatality rates have not come about by accident. Since 2014 RAAus has introduced a combination of strategies and developed a raft of products that have aided in this improvement.

In the Safety Portfolio these actions have included:

- Development of an SMS implementation plan and schedule, including identifying key personnel and development of an SMS gap analysis resulting in the progressive roll out of an organisation wide Aviation Safety Management System
- Developed a purpose-built occurrence management system (OMS) and associated reporting and measurement of occurrences to provide guidance for decision making
- Since its introduction in October 2015 the OMS has received over 800 reports from members and we continue to see an increasing willingness to report
- Provided improved visibility of accident and incident reports and outcomes to RAAus members via our website https://www.raa.asn.au/safety/accident-and-defect-summaries
- Worked strategically with aircraft importers and manufacturers on safety related improvements and defect reporting
- Formally trained key personnel in the use of the SMS, audit and accident investigations through SouthPac and the ATSB
- Developed a range of safety education and promotional campaigns, including Safety Month, the annual Safety Booklet, quarterly safety enews communications and regular presentations at member forums
- Established a formal safety committee that meets each quarter to review progress and develop strategies to continually improve safety within RAAus
- Developed a completely new Complaints Handling and Disciplinary Framework to ensure RAAus and our members have a clear and simple process available
- Finalised development of a risk framework, including establishment of a Board level Risk and Audit Committee, development of a Risk Appetite and associated risk policies
- Developed a Safety Policy and Safety Objectives, which embodies our prime directive of an open and fair reporting culture
- Developed an Emergency Response Plan to place RAAus at the forefront of accident investigations
- Reduced our attendance

Calendar Year Normalised Fatality Data

Calendar Year	Fatalities	Hours	Fatals per 100,000 hours
2017	4	379,646	1.05
2016	6	207,893	2.88
2015	9	211,431	4
2014	6	226,364	2.65
2013	11	243,637	5

at Coronial Inquests since 2015 to zero due to improved fatal accident reporting and investigation.

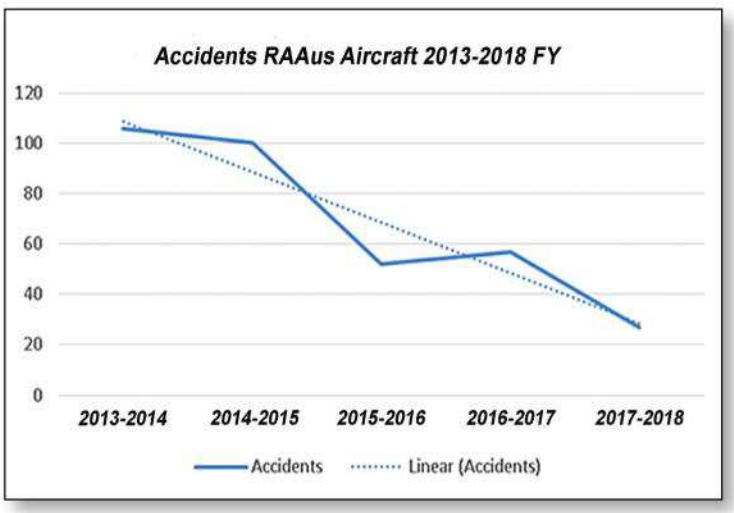
During 2018, RAAus is rolling out the final pillar of our SMS and engaging with our schools to put in place the necessary tools and resources to ensure organisational adherence with an SMS.

Outside of our safety portfolio we have made significant improvements to our operations and technical areas. This has included:

- The delivery of professional development sessions across the country
- The creation of the first RAAus Flight Instructor Reference Manual with standardised briefings
- A significant increase in the number of new RAAus schools who are existing CASA approved schools
- The roll out of an online L1 training tool, which is being augmented by a practical tool in 2018
- The creation of a technical advisory panel
- The creation of a range of online training tools and videos.

RAAus is a different organisation to what it was in 2014. We are committed to working with industry to both keep aviation safe and also expand the opportunities available to allow aviation to grow in Australia.

We are excited by our future and see some bright and clear skies ahead.



MAIN: The number of recreational hours flown is on the rise.

ABOVE: This chart shows a positive downward trend in accidents since 2013-14.

From Gliding to Building

After watching an air show at his local airfield, Narromine cotton farmer Jon Elder reckoned it was time to let go of the gliding and take up a powered licence. Words and pics from **Kathy Mexted**

Jon's partner Karin was supportive of the idea because it meant that his flying could now involve the whole family and facilitate their recreational time.

Jon originally intended to buy a certified aircraft, however after investigating all options he settled on an RV10 because it seemed like better value for money. Just before laying down his deposit, Jon rang the then SAAA secretary, David Brown seeking advice. As Jon circled the paddocks in his tractor into the night, David laid out the harsh realities of time and cost involved in building. It was great advice and Jon realigned his expectations. David also drove home the point that building an aeroplane is a serious business.

Bracing for the five-year time frame, Jon hooked into it with his brother and other SAAA members. The aeroplane was completed in two years.

"Perhaps I overstated the commitment that building would require," said Jon. "I prepared Karin for a five-year project and that I'd probably be in the shed for most of that time. She agreed because she could see the possibilities that an aeroplane would bring. Instead of the expected five years, I was airborne within two. I didn't want to isolate her any more than she already was. She says that I probably over-compensated by being more hands-on with the family when I was at home."

Jon compliments the SAAA for their guidance and assistance. He appreciated that there are certain things you just can't know and as a first-time builder, you can't see things through experienced eyes.

When it came to painting, Karin chose the colour based on the colour and tone of an Apple Mac computer. Its distinctive tail decorations were the original creations of the couple's four-year old daughter Noa, who had been a regular visitor to the workshop during the build. Noa drew a picture of her parents which were digitised and made into decals for the tail.

> « make sure the people who are important to you are happy with what you're undertaking »

"My advice to a new builder would be to make sure the people who are important to you are happy with what you're undertaking. You also should be realistic about costs. When I started, the US$ was almost at parity and then got down to $0.70 when I came to buy some more of the components," said Jon.

"Once it was completed, I then needed an airstrip so I Googled all I needed to know and ended up grading an 1100 x 300 m strip. It repays itself as I now hire it out to the aerial ag operators. It's useful for more than just me. The first time the ag pilot came over he couldn't find it. It was too big! He laughed and said he couldn't believe he'd done that."

Aside from getting away from it all, the aeroplane has proven its worth on the farm as a useful way of accessing parts quickly. When the all-important bore pump broke down during the cotton-growing season, Jon was able to scoot over to Gunnedah and get something machined up and back to the farm to get the pump working. It would have taken days if he couldn't have flown over and sorted it out so quickly.

"I've done about 80 hours in the RV and we've had some good trips to Bankstown, Glen Innes, Essendon and others. We are looking around for the 'ideal getaway', which would be an airstrip with a cottage and beach right beside it. It would be great to know where that place was and to spontaneously make trips there to get off the farm occasionally."

RIGHT: Jon thought the RV10 offered great value for money.

ABOVE: Noa's custom artwork adorning the tail.

Managing the Risks

CASA CEO and Director of Aviation Safety Shane Carmody details CASA's evolving approach to risk management.

Risk is a concept at the heart of what we all do in aviation. Whether we fly, maintain aircraft or run an aviation organisation, we need to have a sound understanding of the risks we face and how they can be successfully managed. Understanding risk management in your organisation is essential to a successful business model.

Our knowledge of risk and the best ways to mitigate risks is continually evolving and must never be allowed to stagnate. As every pilot knows, a critical element of safety for each flight is being aware of all the potential risks on the day well before take-off. A safe flight yesterday doesn't mean a safe flight today.

In this area CASA is no different to everyone else in aviation. We place risk management at the core of what we do and think about the issues all the time. And just like the rest of aviation we cannot sit still in our approach to risk management. As our understanding of risk management has grown, the way we deliver safety support to the aviation community has evolved, with a greater emphasis on training, education, guidance and sharing safety experiences. Prioritising and targeting risks has become essential as aviation has expanded and become more complex.

Right now CASA is actively pursuing new approaches to risk management in a core area of our responsibilities – surveillance. One of the functions set out for CASA in the Civil Aviation Act is: "conducting comprehensive aviation industry surveillance, including assessment of safety-related decisions taken by industry management at all levels for their impact on aviation safety". Naturally, there are different ways to discharge this function and we have always sought to use our surveillance resources as effectively as possible by making changes and improvements over time.

In recent months we have been developing plans for a sector-based approach to surveillance that targets the identified risks for each sector. For some time now we have been producing sector risk profiles, which are excellent reports looking at the vulnerabilities of individual aviation sectors and safety trends in those sectors. These sector profiles allow CASA to work more effectively with the aviation community to address current and potential risks. Under our new approach sector risk profiles will also play a central role in driving surveillance planning and delivery by identifying the key safety issues in each sector that should be in focus. This will bring a new level of consistency to the planning and conduct of surveillance activities. It means a surveillance activity such as an audit of an air operator will not be conducted with a focus purely on operator specific issues.

The goal is to be looking, as far as is possible, at the bigger safety picture. CASA's main focus should never be about handing out "safety tickets" but searching for weaknesses in risk management and ensuring they are addressed in the most appropriate and timely manner. The planned new approach will also lead to greater transparency as the issues CASA will be looking at can be readily identified from the sector risk profiles. If you are behind the performance of your sector in certain areas you can expect CASA will identify this issue and seek improvement.

> « The goal is to be looking, as far as is possible, at the bigger safety picture. »

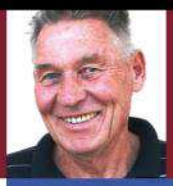
This new approach to surveillance is still being developed, however the initial feedback from air operators who have been part of a new surveillance trial has been encouraging. Comments include: "the process was more consultative and collaborative than previous audits, there was less trying to find things wrong or trying to catch us out, the surveillance seemed to be more structured and flowed better than usual audits". As we finalise this new approach to surveillance we anticipate clear benefits for aviation safety, for CASA and for the aviation community.

CASA

CASA will be searching for weaknesses in risk management.

What can we learn?

JIM DAVIS



Jim Davis has 15,000 hours of immensely varied flying experience, including 10,000 hours civil and military flying instruction. He is an established author, his current projects being an instructors' manual and a collection of Air Accident analyses, called 'Choose not to Crash'.

Cardinal Sins

CAA Accident Report Summary

This discussion contains extracts from the SACAA's accident report. It is compiled in the interests of promoting aviation safety and not to establish legal liability.

Date of Accident: 26-07-2007
Time of Accident: 0830Z
Aircraft Registration: ZS-FJY
Type of Aircraft: Cardinal (C177)
Pilot in Command
Pilot licence: Private
Licence Valid: yes
Age: 37
Total Flying Hours: 188.4
Hours on Type: 181.8
Last Point of Departure:
Bethlehem Aerodrome
Next Point of Intended Landing:
Bethlehem Aerodrome
Location of the Accident Site:
Runway 31 at Bethlehem.
Meteorological Information:
Weather was fine.
Visibility: CAVOK
Number of people on board: 1 + 2
No. of people injured: 0
No. of people killed: 0

SYNOPSIS

The pilot, accompanied by two passengers, departed from Bethlehem Aerodrome on a private flight returning to the aerodrome. According to the pilot, on final approach for landing on runway 29 with 30° of flaps and at an IAS of 60 mph in calm wind conditions, he "felt that there was no response from the elevator and immediately realized that there was a big problem".

The pilot then decided to land on runway 31, which had a grass surface. In order to land without any elevator control, he increased and decreased the engine power setting to control the pitch of the aeroplane. However, upon touch down, the aircraft bounced three times before it came to a stop. The nose landing gear collapsed. The occupants escaped without any injuries. The aircraft sustained minor damages to the propeller, nose gear and main landing gear.

On-site investigations revealed that the right-hand elevator control cable had failed due to corrosion caused by leakage of battery acid.

The last MPI (Mandatory Periodic Inspection) had been carried out on 12 October 2006 at 4783.2 hours and the aircraft had flown 78 hours since then. The airworthiness department had conducted audits on 23 September 2005 and 20 September 2006 and no major findings had been recorded.

PROBABLE CAUSE

The elevator control cable failed due to corrosion as a result of battery acid spillage at the point where the cable is routed through the fairlead in the aft section of the fuselage.

Extracts from the full report

The battery is situated above the cables in the aft fuselage section. The battery overboard vent-pipe was found to be venting into the fuselage instead of overboard. From the work-pack, it was established that the AMO had inspected the control cables but had not noticed the corrosion.

In the interest of aviation safety, it is recommended that the AMO should be audited regarding maintenance practice in terms of scope of work and approval certificate.

Jim's Analysis

Wow! This is one to make everyone sit up and pay attention: pilots, AMOs and particularly the CAA themselves.

Let's start with the CAA. Once again, their report is a disgrace.

1. At no stage did they condemn the Aircraft Maintenance Organisation who, in my opinion, should be held largely responsible for what appears to be criminal negligence. But of course, if they had done so, it would reflect badly on them because they had audited the AMO twice in the previous two years – and seemingly found all in order.
2. They also failed to tell us, anywhere in the whole report, which elevator cable broke. They said the right-hand one, but didn't say whether it was the UP cable or the DOWN cable. The very helpful AME, Douglas Woods, in PE, hauled out the manuals for me, and found that it was, in fact, the DOWN cable that broke. So if you moved the stick forward it would just go flop against the panel without doing anything.
3. And how do you like their safety recommendation? They think it would be a good idea if they did their job and audited

> «the CAA may as well have given us a diagram of Jeremy Clarkson's underwear.»

the AMO. Hell, they had just done exactly that and failed to notice the problem.

4. The CAA, as usual, bulked out the report with repetitions, to make it look comprehensive. But on this occasion they excelled themselves by giving us a full-page picture of the battery, and the solenoid, and every fuse, and every wire, and every nut, and every washer. However, it does *not* show the only important part: the battery-box breather that breathed acid onto the cable. That is simply not part of this diagram. And nor are the control cables. For all the use this diagram is, the CAA may as well have given us a diagram of Jeremy Clarkson's underwear!

Now let's look at what should grab the attention of AMOs.

1. The report says the AMO inspected the cable but failed to notice the problem. Come on guys ... this is just bull. It's just shorthand for "risked killing people by failing to do their job."
2. This has to be a reminder to everyone in the hangar that even the smallest detail can be a life-and-death matter. Most maintenance guys don't need to be reminded of this, they are generally very conscientious, but it only takes one careless bit of work …
3. It is also a reminder that you have to view each maintenance operation as if you had never seen the aircraft before. If you don't look at the aircraft with "new" eyes every time you see it, maintenance accidents will continue to happen. It's too easy to think "xyz must be okay, we looked at it last month."
4. This particular problem was on a 38-year-old aeroplane, but it could equally have happened on a brand new one. Remember the bathtub graph that shows the probability of failure? It shows a high likelihood of something going wrong in the first part of any machine's projected lifespan as well as towards the end.

Okay, now let's look at this accident from a pilot's perspective.

I must both praise and criticise this pilot. First, let's see what he did wrong – and it wasn't much. It's simply that he would have saved himself a terrifying flight if he had done a more thorough pre-flight.

As with the AMO, he fell into the trap of being too familiar with that particular aircraft. Had he inspected it with "new" eyes he may have spotted a hole in the bottom of the fuselage with no vent pipe sticking out.

A couple of years ago I helped my mate Brian prepare for a commercial flight test in a Piper Arrow. I could see him getting more and more impatient as I insisted that we examine every little bit of that aeroplane minutely, and discuss the various systems to the nth degree. In fact, we took so long with the pre-flight that we ran out of time and never got into the air.

Brian eventually admitted, with a wry smile, that it was indeed time well spent.

What happened with this accident can happen in your aircraft today if you don't use "new"eyes for every pre-flight.

And once a control cable breaks, your life is in the hands of the gods.

Or is it?

Actually no – here's how you can easily fly, and land, an aeroplane with a broken control cable for any of the three main flying controls.

What Can We Learn

- If you are an AME, use *new* eyes on familiar aircraft every time.
- If you are a pilot, use *new* eyes on every pre-flight.
- A cable failure should be no sweat *if* you are prepared for it.
- My perpetual bleat: read the POH so you can understand the systems. Then you will know what to look for in a pre-flight. And how you can handle mechanical problems in the air.

In this case the DOWN cable broke and the stick flopped uselessly forward. All the pilot had to do was trim the aircraft firmly nose down, and then fly, and land, the aeroplane absolutely normally – albeit with a constant back pressure on the stick.

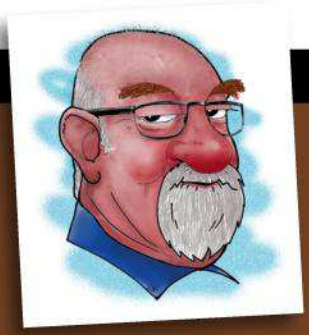
Obviously, with a broken UP cable, you would simply trim it well up and fly with forward pressure on the controls.

Broken aileron cables should be no problem – simply fly with the rudder alone. And a broken rudder cable really doesn't matter – except for maintaining direction after landing a taildragger. With nosewheel aircraft the steering should still work fine without rudder cables.

And while we are on the subject, if a throttle cable were to break– and it has happened to me–I would prefer that it defaulted to full throttle. You then use the mixture control as a fairly crude throttle – it is quite enough to get you to the nearest airfield and see you through a safe landing. You even retain your option to do a go-around if needed.

The kernels of wheatie

DAVE WHEATLAND



Dave "Wheatie" Wheatland started out flying crop sprayers around South Gippsland in Victoria and was instrumental in the development of the GippsAero GA200 Fatman and the GA8 Airvan. He has ferried and demonstrated the GA8 all around the world, clocking up 3000 hours on the type. Dave is currently heading up the test schedule for the GippsAero GA10.

The Eternal Battle of Luck verses Skill

Dave Wheatland *talks about times when skill was found dormant and luck stepped up to produce a good outcome.*

Surprises are nice, sometimes, and on other occasions surprises are very unwelcome. I like the nice ones. One such nice event happened on one of my delivery Flights in USA when circumstances required me to fly from Seattle on the west coast to Minneapolis St Paul, the twin cities which are in the mid-west of the US, but more than a few less comfortable moments accompanied this flight. Unlike flying in the southern parts of the "lower 48", Alaska being a case of its own, the weather and terrain feature often in a more negative aspect of the northern parts, especially those parts associated with the Rocky Mountains. The Rocky Mountains are aptly named, with all parts above the snow line being rocks of various sizes, but all of very pointy and sharp features; not recommended as emergency landing sites. Below the snow line the towering trees are equally forbidding, but also majestically beautiful.

Flying across the southern USA, when required, is much like the more remote parts of the GAFA, but of course this is the USA, so a major city happens along every hour or so with all mod cons including avgas with pump service, a pilot's lounge and free crew car if needed. No real ugly mountains, lots of emergency landing sites, but still things to see: Hoover Dam, the Grand Canyon and Monument Valley along the way make for a pleasant and low stress working environment. Of course, there are the MOA's, the Military Use Airspace areas hatched on the map, but often a quick call will help with transit, although they are a bit sensitive around the Area 51 area and that means a trip through Death Valley, and past the unlikely named town of Ballarat, far from its Australian namesake.

> «in the words of Bob Hoover: 'I would rather be lucky than good.'»

George and I were wandering through this region on an eastbound expedition last year, and as we approached Las Vegas to overfly we were surprised to get several TCAS warnings that raised the blood pressure and pulse rate as our necks swivelled about looking for the aircraft in close proximity. I had been listening intently to the traffic in the training airspace just to the north and was sure we were well informed, but as our TCAS alerts started occurring every time we flew past the rock escarpment of Red Rock that leads into the Las Vegas basin, we realised that it was reflection of our own transponder that was setting off the fish-finder. A nasty surprise to get the alerts, but a pleasant outcome as we flew onwards past Nellis Airforce Base while following the Interstate 15 to the east.

I believe that it was along the I15 some years ago that a Cessna 150 and an F-16 missed each other by less than two metres with neither of the pilots seeing each other. It was only when the jet's forward-looking TV/metadata was being reviewed that a blur appeared to flash below the jet's nose in only about three frames; from a dot to a bird to a blurred blob with an unmistakable tail fin! If the Cessna had been only a few feet

It has been said that no-one will live long enough to make every mistake there is to be made, so to stay safe we have to learn from the mistakes others have made. GippsAero test pilot Dave Wheatland has spent his career operating aeroplanes on the very edge of their limits and has a swag of yarns about how flying taught him some hard lessons that we can all learn from.

BILL WARDLE

higher there would have been a very nasty surprise for both pilots, but I suppose ignorance is bliss, so although there was imminent disaster, there was no stress. This is a preferred state and there was a good slice of luck, but in the words of Bob Hoover:"I would rather be lucky than good."

Bob was both, but his ability assisted with providing luck from time to time. Over the years I have meet numerous aviators of the famous type from astronauts and X-plane test-pilots to world-roaming adventurers and air show performers. Both skill and luck always featured for them, although of course you don't usually get to meet too many of the unlucky ones. Having been around the traps for a few years now, being mature (but not old I like to think), I have now met about equal amounts of lucky and unlucky pilots, with airshow performers topping the list of unlucky ones. There was never any doubt about their level of skill and ability, but fate really is a hunter and bad luck can ruin your whole day. Of course, as risk is increased, luck gets compromised as does skill and ability, so I suppose that whilst test pilots figure high in my list of friends and acquaintances, the very serious nature of risk assessment and management can serve to minimise the so-called accident rate.

Recently in Los Angeles I had dinner with a good friend Greg Lewis the Director of Training at the National Test Pilot School in Mojave, and although he has flown many different military and research aircraft including the X-29, he had a relatively incident-free career in flight testing and operational military flying over several decades at the leading edge of high-performance aircraft. That is not to say he didn't experience some surprises; they just were resolved in a safe manner.

So, there I was flying across the northern parts of Utah, a state of many spectacular natural scenic wonders riddled with national parks, at about 9000 feet under a heavy overcast well above the freezing level, but clear of cloud, Navigating my way around the higher rocky snow covered peaks, and wondering where Jellystone Park was really located and pondering on how old Yogi and Boo-Boo must be these days (surely Officer Dibble has retired, or was that a different 1960s reality show?), when one of those surprises overtook me. A hole in the overcast suddenly allowed a shaft of sunlight to illuminate a vast and magnificent mountain just off my left wing tip. It was a truly awe inspiring and spectacular sight as a brilliant white 14,000-foot mountain suddenly leapt into stark clarity and beauty, bathed in sun from an overcast that was breaking up even more in my direction of flight. This collection of huge jagged peaks was the Grand Tetons which I had just flown more than halfway around while searching for a route through the maintains, and in a moment of revelation it was transformed from a murky cloud and mist shrouded jumble of rocks and trees embedded into into a heavy grey cloud base, into a most incredible sight as I rounded its southern side and flew into the bright light and of the afternoon sunshine bathing its western aspects.

Yes, a surprise, with a fabulous conclusion, and one that alternatively may have been a wide valley full of low cloud and freezing rain, but instead was a turning point in the weather as I flew on into Wyoming and South Dakota that afternoon.

My iPad EFB has access to a lot of enroute weather notifications in the USA, and is well better informed then what we have available in Australia at this time, and without such awareness it is likely to have been a day when I would have stayed on the ground in Washington State. But armed with intimate real-time weather, radar and constantly updated METARS, some fundamental flight skills, a strong get-out-of-jail nerve that always keeps a back or side door open, meant that I could mitigate hazards, remain VFR and out of ice, know where the next fuel was and be treated to another of those magic moments that are locked in the memory banks for all time.

It was a very nice surprise, unlike the highly recommended, but poorly serviced hotel where George and I stayed in that evening in Aberdeen, South Dakota. We did have something to discuss over a couple of refreshing ales despite the well-worn bar top and threadbare carpets!

The RAAA advocates for its member companies, but says it fully supports the GA sector as well.

No Anti-GA Agenda

Recently, the Regional Aviation Association of Australia has been accused of having an anti-GA agenda. CEO **Mike Higgins** *responds.*

The Regional Aviation Association of Australia, through its many initiatives, fully supports the general aviation sector of the industry. Not only does the sector significantly contribute to the overall social and economic growth of Australia, but also the vast numbers of passionate pilots and engineers in training and employment provide great benefits from general to regional aviation and the domestic airline market and beyond. The RAAA is proud to work consistently and collaboratively with industry and government to ensure the viability and progression of general aviation in Australia.

Scholarships

The Regional Aviation Association of Australia (RAAA) members recognise the importance of a vibrant GA sector. For example the RAAA facilitates, through its members, Trial Instructional Flights (TIFs). This is often the first foray for many aspiring pilots and is so often where the aviation spark has been ignited in many a young person who then ends up as Pilot-in-Command of large airliners all around the world. The RAAA and its members recognise the importance of this introductory mechanism and proudly sponsor TIFs, with the lucky candidates announced at the RAAA Annual Convention held in October each year.

Other RAAA sponsorships include multi-crew and turbo-prop aircraft endorsements, as well as funding towards further pilot and engineering training and education through our RAAA member organisations.

Flying Training Action Group

The RAAA advocates on behalf of member flight training organisations (FTO) and has recently established a Flight Training Action Group (FTAG). We have already met in Bankstown, Perth, Moorabbin and Adelaide. This initiative is headed up by RAAA Board director David Trevelyan (Basair CEO). The purpose of the FTAG is to identify, as a group, the key issues facing this sector of the industry.

The RAAA has successfully lobbied, along with other like-minded parties, to have the Basic Class 2 medical review carried out by CASA. This should allow experienced airline captains who can no longer hold a Class One medical to hold an instructor rating. This will add instructing resources into a depleted market and unlock all that experience to be passed on to student pilots. We also have eight long-established and deeply experienced FTOs as members. This gives us significant resources in dealing with the intricacies of government bureaucracy.

Pilot shortage

Several high profile airlines have begun canceling flights due to experienced captain shortages. The unusually deep and unforeseen sustained recruitment activities by overseas airlines have proven to be the main driver of the shortages. The traditional method of a short to medium term solution was to import pilots on the 457 VISA mechanism. This avenue was halted at the most vulnerable time as a result of ill-informed pressure, from unknown sources, on the government. We are now seeing a reversal of that decision which will provide breathing space to enable our co-pilots to attain the necessary experience and qualifications to become captains. The AFAP website has six pages of jobs currently being advertised for pilots. There has never been a better time for aspiring aviators to join the industry.

TAAAF

The RAAA is one of the founding members of The Australian Aviation Associations Forum (TAAAF). The TAAAF is made up of almost twenty aviation industry associations, all representing the many and varied facets of general and business aviation activities.

Smaller focus groups, such as the Australian General Aviation Alliance, can be an effective way to distil relevant issues before being prosecuted more formally by the TAAAF and the Aviation Safety Advisory Panel.

There has never been a better time for aspiring aviators to join the industry.

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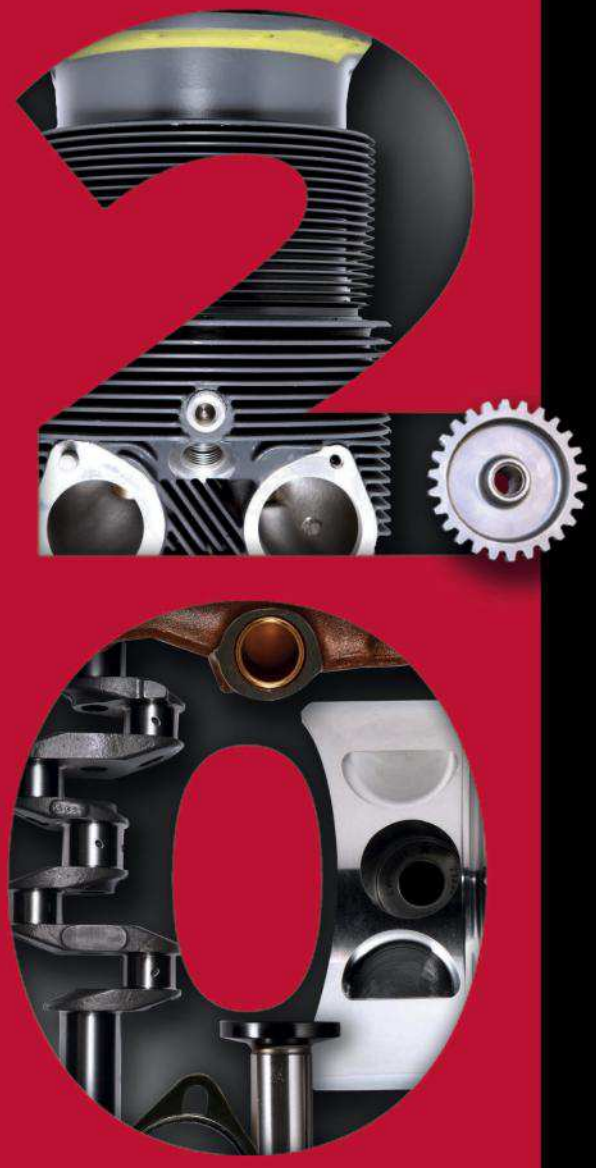

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