SPORTPILOT

RECREATIONAL AVIATION AUSTRALIA / NOVEMBER 2017 VOL 75 [11]

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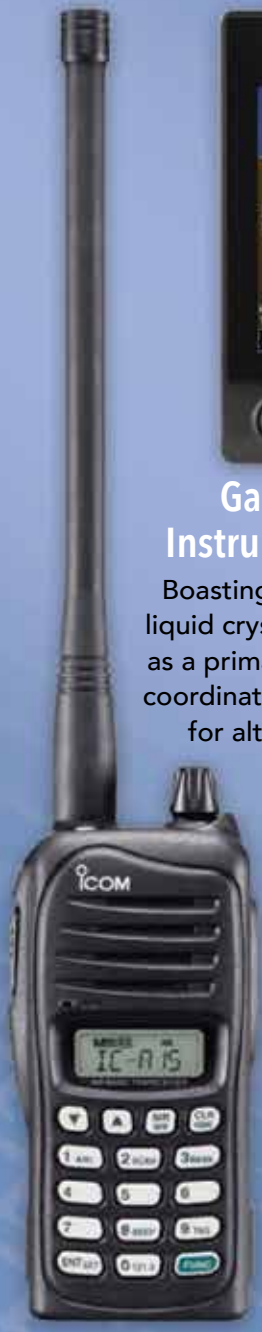

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ON THE COVER

"The world owes a big debt to American billionaire Elon Musk."

On the cover: Sun Flyer 2
Photo: Bye Aerospace

REGULARS

COLUMNISTS

NEWS

FEATURE STORIES

READER STORIES

FLY-INS

EXTRAS

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ONE MAGAZINE TWO FORMATS

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TERMS AND CONDITIONS

Nothing ventured

BY MICHAEL MONCK

DAVID and Sharon Young are the two people primarily responsible for AirVenture Australia and for making sure it happens smoothly. Aviators owe them a debt of gratitude for the time and effort they have put in to making sure the event went ahead this year. Needless to say, it was a success. At the time of writing (the Sunday after AirVenture) the final numbers hadn't been tallied, but we have some preliminary figures.

We had 45 exhibitors displaying their wares, ranging from GPS units and headsets, through to some reasonably large aircraft. More than 200 people manned the exhibitors' stands and assisted with coordinating things throughout the weekend. There were 58 seminars over the course of the weekend with more than 2,100 people sitting in on them. The unicom operators counted 440 aircraft coming and going airside and, through the gates, and more than 2,000 people came to see what the aviation fuss was about.

Early reports suggest that at least seven aircraft were sold during the weekend, with one of them valued around $1.2 million. In addition, an aircraft engine found a new home and a couple of second hand aircraft owners are now in contact with potential new owners. This puts the sales volume somewhere in the range of $2 to $3 million. This is only the second time Airventure Australia has been held (and the first using the name) but it is clear already it is getting better each year. Of course, there are things which can always be improved.

It is important to note that AirVenture Australia is a legally separate company and RAAus is a beneficiary, so we don't make the final decision relating to the event. We do, however, have a very good working relationship with David and Sharon and, like the Australian Parachute Federation, we put a lot of work into ensuring the success of the weekend. This also means we get a lot of feedback.

Over the coming weeks we will go over this feedback and work out how things can be done better next time. Right now though, I'd like to look at one particular piece of feedback which has come from a couple of people – about the fences.

We have had a huge focus on safety recently and we will continue to do so. It is the reason the number of incidents, especially fatal ones involving our aircraft and pilots, is steadily declining. The same focus on safety was applied to AirVenture and the fences were part of this.

A few people lamented they couldn't see what was going on (despite there being a dedicated air show viewing area with no obstructions) and that airside access was limited. I think it is important people understand why things were done the way they were.

AirVenture Australia has to abide by all of the regulatory conditions administered by CASA and the local council. A plan is drawn up, it is assessed by the regulator and council and, if suitable, the plan is given the tick of approval. An instrument is drafted allowing the event to proceed. Likewise, we have to satisfy our insurers that all steps have been taken to minimise the likelihood of something dangerous happening. Part of this process involves doing a risk assessment and demonstrating that mitigating actions have been taken. One of the risks is that a member of the public will walk in front of a turning propeller.

I note that on some public forums there have been comments made, comparing how other events manage these risks. Some of these draw a comparison with Oshkosh in the U.S and ask why we can't be the same.

At Oshkosh, people are free to stroll through field after field to admire the different aircraft, talk with the owners and so on. It has been noted that this happens without incident for the most part. Shouldn't we do the same at AirVenture Australia? But the question overlooks a fundamental difference between the events – resources.

Oshkosh, as you no doubt already know, is a massive event. It has a large budget, a huge amount of marketing power and literally thousands of volunteers.

According to the Warbirds News website, in 2017 the attendance at Oshkosh was about 590,000. Visiting aircraft numbered around 3,000. There were 881 exhibitors and the 1,050 seminars were attended by more the 75,000 people. It is a scale we can't fathom here, at least not in the foreseeable future.

At Oshkosh, when an engine starts up, there are marshalls everywhere to ensure any people in the vicinity stay away from the live propeller. Areas are actively managed throughout the event to make sure things are safe. Arriving aircraft are escorted by people on scooters who clear the way for them. Marshalls make sure taxiing aircraft don't inadvertently enter areas where people might be put in danger.

We don't have that luxury. We don't have enough volunteers. In the years we did NatFly, we had a small core group of dedicated volunteers who did an excellent job. But they burned out because they were overworked. There simply weren't enough people willing to give up their time to help out.

I find this a peculiar problem to have. In my role as Chairman, I give up a lot of time because I am passionate about aviation. I truly believe it is something worth putting time into. I also find there are many people more interested in picking fault from a distance, than actually taking the time to understand the problem.

This is disappointing. We should all pull together to make aviation stronger, not tear it apart by public displays of disunity. AirVenture Australia was designed to do just that and yet, here we are two years after the concept was developed, still battling the same old issues.

If we all work together, perhaps we can pull down some fences, both literally and figuratively. With more volunteers helping us achieve our goals, these little issues would disappear, and we could focus on the good stuff.

I get motivation from seeing the challenges we face and knowing it is worth working harder to address them. I get motivation from seeing a great event happen, despite the background noise. I get motivation from people like the AirVenture Australia team who, despite the fog of infighting and stone throwing, know that things like this are worth doing. We could all be a little more like David and Sharon in that regard and RAAus says thank you for all your hard work.

***From the Ed**- Deadlines wait for no one. This edition was put to bed just as AirVenture was happening. We will have full coverage in December.*

A. 5 NOVEMBER
ORANGE AERO CLUB OPEN DAY

A family day. RFDS will be there as well as all the commercial operators from the airport, alongside club members aircraft. For more information, http://orangeaeroclub.com.au.

B. 25 NOVEMBER
GATHERING OF THE MOTHS

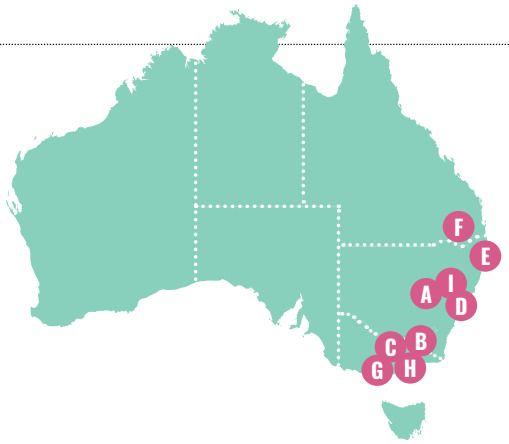
Mount Beauty Airport. Be part of a unique air sports event at the finest mountain airstrip in the Victorian alps. Fly-in to share, experience, learn and demonstrate with a unique mix of sport aircraft. A wide variety of aircraft and fantastic collection of vintage and veteran cars on display - Stay overnight on the Saturday to join in the unique runway dinner event. Lunch, dinner and breakfast all available at the airfield. We are limited in the number of aircraft we can accommodate – so check our website to register, For more information, www.ymbt.org.au or Ross Rynehart 0417 002 886.

C. 26 NOVEMBER
LILYDALE AIR SHOW

Gates open 11 am. For more information, Neroli Merridew 0419 536 911 or www.yarravalleyaviation.com.au.

I. 25 MARCH 2018
WARBIRDS OVER SCONE

Lots of noise and spectacular heavy metal thunder. Paul Bennet will also perform. For more information, https://www.facebook.com/WarbirdsOverScone.



F. 11 MARCH 2018
CLIFTON FLY-IN

Lone Eagle Flying School's annual fly-in includes International Women In Aviation Week. This has become an iconic event in the region and is the premier attraction for all types of aviation in southern Queensland. See various types, shapes, sizes and models of recreational, ultralight and homebuilt aircraft including sport, vintage, general aviation and any other flying machine. Come late pm Saturday, 11th for BBQ, drinks and hangar talk. Fly or drive in, see ERSA. On field camping, bring your swag. Advise for catering. For more information www.loneeagleflyingschool.org.au, Facebook.com/LoneEagleFlyingSchool, admin@loneeagleflyingschool.org.au or Trevor Bange 0429 378 370.

G. 11 MARCH 2018
TYABB AIRSHOW

An impressive day with some of the best air performers. The Peninsula Aero Club has a proud tradition of supporting local community service clubs from the proceeds of its shows. All visiting aircraft should plan to arrive before 10:30 because access will not be granted after that time. For more information, http://www.tyabbairshow.com.

H. 17 MARCH 2018
CENTENARY OF FLIGHT AIRSHOW

It will be 100 years since the first operational military flights in Australia. These were conducted from Yarram in a FE2B aircraft out into Bass Strait looking for the German raiding ship *The Wolf*. This operation was flown by Capt. Frank McNamara VC from the Australian Flying Corp. Yarram Aero Club will honour the centenary of the event. For more information, http://www.facebook.com/YarramCOF/

D. 26 NOVEMBER
SPLASHDOWN

The Seaplane Pilots Association invites you to join with seaplane pilots and enthusiasts for the 2017 Splashdown Conference at Rathmines, NSW. Hear key industry speakers talk on vital seaplane issues. Learn how to be safe on the water in floating hull or on floats. Enjoy camaraderie and fun evening events. Inspect the visiting seaplanes at the former RAAF Flying Boat Base. Stay for the Rathmines Catalina Festival on Sunday after the conference. Registration Is essential. For more information www.seaplanes.org.au or Malcolm Burns 0448 744 763.

E. 6-7 JANUARY 2018
GREAT EASTERN FLY-IN

Evans Head Memorial Aerodrome. Fly-in for a unique Australian aviation get together. Camping, fun activities, air displays, drones, joy flights, aviation history, classic cars, markets, great food and much more. For more information, greateasternflyin.com or Gai Taylor 0427 825 202.

Find out more at www.airborne.com.au
or call 02 4944 9199

22/30 Kalaroo Road, Redhead NSW 2290 & Belmont Airport Pacific Highway, Pelican.

GPS LEADERSHIP

I read with great interest Dave Edmund's article about the safety value of GPS for VFR pilots (Home Builder *Sport Pilot* September 2017).

Dave makes an excellent argument as to why you should be able to use GPS for primary navigation. I would bet my GPS navigation against anyone using more traditional methods, especially in remote areas with few and far between landmarks.

Sadly, it seems aviation authorities are relentlessly conservative and slow to allow the adoption of new technology. GPS is hardly new technology anymore, but we are still being told not to rely on it. I recently asked a CASA representative if CASA was considering including any aspects of EFBs and GPS in the pilot training curriculum and was surprised to hear it was not even on their horizon.

In the real world, every pilot I know or talk to, uses GPS for cross-country flights. Some do it well with good backups and proper planning, keeping track of where they are and the track to their next waypoint. Some just follow the magenta line with no understanding of the risks.

The facts are that nobody should ever get lost if they have a functioning GPS (with backup) – even if it is not TSO'd. This can reduce the incidence of fuel exhaustion because the pilot gets lost or because they don't know exactly how far it is to the nearest airport or their destination. Nobody should get lost because of an error in flight planning like incorrect heading or distance calculations, leading again to erroneous fuel requirements, if they use an EFB flight planner like OzRunways.

As Dave says, "It is way past time when CASA provided an integrated set of rules and advice which optimises the use of whatever technology can make your trip more enjoyable and safer".

RAAus has been at the forefront of safe and low cost flying for more than three decades. Perhaps RAAus can take some leadership on this very important issue?

DON RAMSAY

DINASOAR GLAMPING

I must admit I was doing a bit of YES! yelling when I read the article by Dave Edmunds (Home Builder *Sport Pilo*t September 2017).

I am a Drifter driver and live in the Scenic Rim area of South East Queensland. Yeah, lucky me! I am also not far from bringing my little baby home – the strip has been built, the grass is growing (slowly – damn the drought) and the hangar (hay shed) is being meticulously planned.

Navigating in a Drifter is a little problematic. Ever tried to move a map around in an open cockpit? Map? What map? No point in landing to pick it up – it went through the bloody prop! Anyone below would think I was being targeted by surface to air missiles and was dispensing chaff!

Marking a waypoint on the map you used to have? Somewhere far below, my pencil lands in someone's back yard and they won't figure out how the hell it got there. I have a lovely little flying area within my legal limits. I don't go north, because very big and fast flying machines live there. I know this because on one momentous occasion, I was approaching the strip at Roadvale at 1,000ft (6nm north of Boonah) and two F1-11s flew across my path (well to the north of me, thank God) at about 500ft. I know that if I don't cross a line between Flinders Peak and Mount Walker, I won't be in their fiercely defended territory.

South is nice, all the way to the Qld/NSW border. East, over to Tamborine Mountain, where I can wave to all my old mates from the Canungra Hang Gliding Club as I slip by the launch site, calling out things like "you poor buggers, look at me, I don't need thermals" and getting the bird in reply.

West, the Great Dividing Range beckons as my boundary. I can go through Cunningham's Gap as far as Maryvale, but what's the point? I would love to fly on for a few more minutes and visit my training field at Clifton, but alas, I am not allowed. Rules is rules. Yes, I am a dinosaur – so is my little Drifter (which I call a 'dinasoar'), apparently. 'Twood be ever so nice to go a little further – but Drifter driving is not one of things that you do high or fast.

But I am lumped in with the guys who fly at 10,000ft and 150kts – I rarely get over 2,000ft and my cruise is a genteel 55kts. Imagine if I could fly for a couple of hours (that's 110nm), have a break for a couple of hours, then fly for another couple of hours (that would be 220nm for the day). That would be about 350kms. I can easily do double that in my Fairlane - with 50 tonnes of B double roaring past in the opposite direction, missing me by a couple of metres.

I have quadruple redundancy with my GPS equipment, including a $2,000 GPS, Notebook, and two mobile phones. Weather? It's pretty straightforward with a Drifter – I have a Captain Cook in the direction I am going and, if it doesn't look 100 percent, I look at my phone and an app will tell me what the rain, temperature and wind is along my track – easy peasy. The back seat is not the best place for a couple of 20s of fuel, but nowhere else to put them, unfortunately. The Drifter drivers who have ventured afar (would you believe Boonah to Avalon) have designed a big soft bag which hangs under the wing, longitudinally, behind the pilot. In there is enough space for the tent, clothes and all the equipment needed for glamping. Weight is certainly an issue, but I don't know if I would go as far as following a Kiwi's idea of cutting his toothbrush in half to save three grams.

I did have visions of flying off into the sunset in my little Drifter for a jaunt around Queensland after I retire. But then I found out what was involved in getting a Cross Country endorsement. First problem is the aircraft I fly – no flying school around here flies Drifters – which means I would first need to get rated on another aircraft and then do my training in that aircraft. An aircraft, of course, which would have performance just a little different than my dinasoar. The solution?

It is too time consuming and expensive for me to go to either Clifton or Gympie on an extended basis to get those little letters on my Certificate. I think the best way to do it would be to turn up and stay there until the deed was done. Then off I shall go. Drifter glamping for me – and of course, as my little dinasoar is the wire-braced version, I will always have somewhere to hang my washing. I will just have to remember to take it all down before my next flight, but that shouldn't be a problem because with any luck, it will show up on my next pre-flight inspection.

DAVE TONKS

FROM RAAUS */ The RAAus Board and staff spent considerable time during the last Board meeting discussing segmentation of our membership requirements, privileges and expectations to address exactly this issue. We will consult with members once preliminary work is completed, to deliver better value to all members regardless of the type, complexity and intention of flight intended. Watch for this soon.*

WRITE IN: EDITOR@SPORTPILOT.NET.AU

The state of the organisation is reflected in the Letters to the Editor columns. The more letters – the healthier the organisation. So don't just sit there – get involved. Your contributions are always welcome, even if no one else agrees with your opinion. The Editor makes every effort to run all letters, even if the queue gets long at certain times of the year. (By the way – the Editor reserves the right to edit Letters to the Editor to shorten them to fit the space available, to improve the clarity of the letter or to prevent libel. The opinions and views expressed in the Letters to the Editor are those of the individual writer and neither RA-Aus or *Sport Pilot* magazine endorses or supports the views expressed within them).

A MATTER OF INSURANCE

RAAUS, in association with PSB insurance brokers, supplies all members of the organisation with a Members' Liability Policy. This provides legal liability protection for members who hold a Student Pilot and/or Pilot Certificate, while operating an RAAus registered aircraft.

The policy is a responsible and cost-effective measure to protect members and (indirectly) the general public, so it's important everyone understands the way the cover works. It's also important to be aware of its limitations and how it interrelates with other insurance you might have. It was never intended as a total solution.

An important thing to consider is that the Members' Liability Policy is not a Personal Accident or Health Benefits cover.

It is designed to protect you for claims made against you by third parties (or passengers). Under Australian law, liability must be proven against you (often in court) and the third party must quantify/demonstrate their loss.

Under Australian law there is no limit to the amount of money an injured party can claim against you - the court will ultimately decide the amount.

Payments to third parties under the policy is not automatic. Legal action must be taken against you and you must be found to be legally liable.

Frequently asked questions:

The policy only covers RAAus Ltd and members of RAAus who hold a current Student Pilot Certificate and/or Pilot Certificate and/or affiliated clubs.

It is important to note that flight training schools do not fall under the definition of 'affiliated clubs' and require their own insurance cover.

Unless you fall within this definition, you will not be covered. E.g. If an aircraft is owned by a Pty Ltd company or superfund, you are not covered.

The cover has an indemnity limit of up to $10,000,000 for liability arising from third party property damage or third party bodily injury, however there is a sub-limit of $250,000 for liability arising from injuries to passengers (including student pilots).

Australian law does not limit the amount for which you can be held liable, therefore you may require top-up cover.

No cover is provided for airfield operators. A separate policy is required for this purpose.

No cover is provided for rotary wing or auto gyro/gyroplane operations.

No cover is provided for maintenance activities or hangar owners.

PSB and RAAus recommend every aircraft owner and operator seek individual and detailed insurance advice. Every member should obtain and read a complete copy of the policy terms and conditions. A copy can be downloaded from the RAAus or PSB websites.

For more information, Geoff Tonkin gtonkin@psbgroup.com.au or (08) 8267 2875 or Ben Noakes bnoakes@psbgroup.com.au or (03) 8841 3303.

WEATHER CAMS

FIVE more weather camera sites have been added to the Airservices website.

The cameras allow pilots to see the actual conditions at locations. Since the launch of the first ones in May, the portal now has a total of 17 sites.

Airservices CEO, Jason Harfield, says the first phase of the project focused on identifying locations with suitable 'ready to go' camera infrastructure.

The new locations are Avalon, Cairns, Coolangatta, Mackay and Toowoomba.

Cameras are already operational at Albany, Archerfield, Coffs Harbour, Esperance, Kalgoorlie, Kingscote, Kilmore Gap, Launceston, Mt Gambier, Norfolk Island, Parafield, Toowoomba and Wagga Wagga.

Airservices says more cameras will be installed at safety critical locations. An online survey completed in April helped identify potential future sites.

To access the cameras, https://tinyurl.com/yc3vwexj.

BIG CROWDS AT BIRDSVILLE

RECORD crowds travelled to Birdsville this year with increased numbers through the airport.

The weekend weather was favourable for landing on Runway 14 which is the preferred option for Birdsville, with only light to moderate winds until Sunday when a front went through and brought strong winds.

The sealing of the runway and apron a couple of years ago has been a great improvement. The aviators included Senator Pauline Hanson and James Ashby from One Nation Party who flew in for the weekend in their now infamous Jabiru. The Governor General, Sir Peter Cosgrove and Lady Cosgrove, arrived Saturday in an RAAF Challenger jet and Gracie Grace, Queensland's Minister for Racing arrived in a government jet for the main day on Saturday. The Royal Flying Doctor Service Kingair was relocated to accommodate the RAAF Challenger during the day.

Charter operators Calibre Aviation and Wrightsair were kept busy during the weekend with flights to the desert and Lake Eyre areas.

Ballina Aero Club had a good weekend controlling the airport. The club is continuing discussions with Diamantina Shire regarding future involvement. It also welcomes all volunteers.

For further information, ballinaaeroclub@bigpond.com or 0418 663 666.

CASA TO GIVE RULE BREAKERS A BREAK

CASA is changing the way it enforces the regulations on pilots who break its rules.

A new instruction from the Director of Aviation Safety, Shane Carmody, to CASA staff clarifies how information can be used when CASA makes decisions about whether enforcement action may need to be taken.

Individuals and organisations found to have violated a provision of the rules are now to be given an opportunity to address and correct the issues without CASA initiating enforcement action.

According to CASA, action will only be taken where 'there is a deliberate, wilful or reckless breach of the aviation safety rules, where there is a pattern of repeated misconduct or there is a failure to take appropriate corrective or protective action to address identified safety issues'.

Mr Carmody says, "It is vital that CASA does not simply talk about taking a 'just culture' approach to regulation but actively implements the principles into our day-to-day operations and decision making".

"Our rational 'just culture' approach means that where honest errors or mistakes are made, CASA looks to support the efforts of individuals and organisations to make necessary improvements, correct identified problems and ensure safety risks are effectively managed in the process.

"Of course, if the safety rules are deliberately flouted or action is not taken to address safety issues then CASA must and will take appropriate action".

For more information, https://tinyurl.com/ybrwr3et.

OUTBACK AIR RACE ON AGAIN

BY ED JONES

THE Outback Air Race is a GPS-based navigation time trial throughout the remote Australian outback. It was established to raise funds for the Royal Flying Doctor Service and, since 1996, has raised over $2.1 million.

The money raised each time goes towards outfitting RFDS aircraft with medical equipment.

The race is held every three years with the next one planned to depart Archerfield Airport on Sunday August 19, 2018.

With the growth of RAAus, both in numbers and type of aircraft, it is likely quite a number could (probably easily) undertake the route.

RAAus Operations Manager, Jill Bailey says if an RAAus pilot wants to take part in the race, the pilot would need to hold a current Pilot Certificate, with additional endorsements for Cross Country, Radio, Human Factors, Passenger and any requirements for aircraft endorsements like retractable undercarriage, tail wheel, etc.

Additionally, the aircraft must be registered with RAAus and any maintenance required (scheduled and non-scheduled) must have been completed before the race starts.

RAAus pilots would need to supply their membership number and aircraft registration so organisors can confirm both are current.

For more information call 0403 379 256, email ground@outbackairrace2018.com.au, or visit www.outbackairrace.com.au.

MICROLIGHT TREK

BY MARTIN BRAATZ

HOW about flying to far north Queensland for a four-week adventure?

Southern state microlight/trike pilots are all invited to take part in a trek in May – June next year. Departure point will be Holbrook and the trip will go all the way to Cooktown before turning around.

A support vehicle will accompany the group to carry fuel, supplies, personal belongings and spares and will be used to transfer the group to and from airfields to accommodation, and to and from tours and attractions along the way.

Support vehicle costs will be shared by the participants. Accommodation will be a mix of some on-airfield camping, cabins, lodge and motel, depending on location, weather and budget.

There will be stunning scenery, snorkelling on the Great Barrier Reef, QANTAS Museum and Stockman's Hall of Fame at Longreach, a beach landing or two, the Daintree, rainforests meeting the ocean, crocodiles and other wildlife. It will be the best time to be in the air in this part of the country.

For more information, info@waterfallcreek.com.au

FINANCIAL CHECK

IF YOU are planning to buy a second-hand aircraft, it might be prudent to check the machine is clear of hidden financial burdens.

The federal government now provides a personal property security register which allows you to see at a glance if any money is owing on your dream machine.

It's not a great idea to shell out big bucks for a new machine, only to have a finance company repo it from you soon afterwards.

There is a small fee for searches, but it could save you more in the long run.

For more information, https://www.ppsr.gov.au/.

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Power Performance Price

Jabiru Aircraft Airport Drv, Bundaberg Q 4670 Ph +61 (0)7 4155 1778 Fax +61 (0)7 4155 2669 info@jabiru.net.au www.jabiru.net.au

Decision due on frequencies

BY BRIAN BIGG

A DECISION was due at the end of October on the much contentious use of frequencies in low use airspace.

Earlier this year CASA issued a discussion paper setting out two options for radio broadcasts in the vicinity of aerodromes in class G airspace, including those not marked on aeronautical charts.

At the moment, the options are to use the appropriate area frequency or the MULTICOM frequency 126.7.

CASA pointed out in May that its preferred option was to retain and enhance the use of the appropriate area frequency, but at least they did ask our opinion. CASA says 390 people responded, 382 of them online, eight by email and 75 written. Most were private individuals, although Airservices Australia and Australian Maritime Safety Authority also provided submissions.

According to CASA, there was broad support for MULTICOM (82%), compared with 43% support for Area VHF.

On the question of what height the use of the chosen frequency should apply, there was a preference for A050 (39%), followed by 3,000ft AGL (23%), 2,000ft AGL (16%) and A030 (8%).

AREA VHF

Support for Area VHF was mostly based on the added safety benefits of access to air traffic control, while criticism hinged on concerns about coverage, frequency congestion, current uptake and lack of clarity surrounding the appropriate frequency in any given region.

MULTICOM

Support for MULTICOM reflected the view that it has better coverage, high levels of established usage and is straightforward to use due to a uniform frequency across all regions. Respondents also stated a desire to separate ATC services from pilot broadcasting to reduce the risk of over-transmission.

CASA said it had been considering the impacts of any proposed changes on the overall air traffic management system, to ensure they meet the needs of all airspace users and are considered as part of an enhanced and improved airspace design.

It expected to be in a position to advise industry of its policy decision by the end of October.

Quietest AGM in years... and that's a good thing

BY BRIAN BIGG

IT'S most unusual to be happy to report that very few people turned up to the RAAus 2017 Annual General Meeting in Canberra.

After all, it's a 9,000-member organisation and we've had AGMs in the past where hundreds have attended in all their glory and self-righteous anger. You'd think there'd be something to complain about every year, but apparently not, and several people at the meeting made the comment. There were a dozen or so members who made the effort, probably just as much for the finger food and coffee afterwards, than to see and hear the Executive in action. Most hung around for the presentation to the GYFTS Scholarship winners, which took place afterwards.

In contrast to years past, there's a palpable mood within RAaus ranks at the moment that things are under control, that the wild gyrations from years past have been replaced by an increasingly efficient machine. In my opinion, the overwhelming vote for Chairman, Michael Monck, reflected that contentment. Members can see that RAAus is finally showing it is capable of growing past its roots as a shed full of crazy men and has become (or is on track to becoming) a professional organisation which can be relied upon and is consistent in its message. That it has a proper plan in place for the future.

So the low turnout at the meeting actually shows most of us have cooled our jets, relaxed and begun to trust. So, other than for the finger food, why bother to trek to Canberra just to get good news?

Here are some of the highlights from the Annual Report which make my point.

CHAIRMAN'S REPORT

"For the past few years we have maintained a stable approach to how RAAus is run. We have a stable board with faces that have changed to introduce fresh ideas and thoughts while also retaining a great deal of corporate knowledge. We have a CEO that has been in place for many years now and is delivering, slowly but surely, the things we should have been delivering in the years prior to his appointment. Our senior ranks are stable too. For the first time since my joining the board we have our first changeover in our National Safety, Risk and Compliance Manager position. To me this demonstrates a degree of maturity in our organisation. I look at the world around us and there is a great deal of change in many other organisations and that creates difficulties. I can't imagine how hard it would be to get some solid progress in an organisation where the board is constantly changing and each new iteration sets a new direction with different policies. Likewise, it is difficult for a board to achieve anything when those faces reporting to them are in a constant state of flux. Worse still, imagine a situation where there is no consistency over time within the board or the management team. It isn't difficult to envisage the problems that creates in terms of delivering any positive outcomes. If we had to single out one key factor to our success then I would say it is this stability. While we haven't yet achieved everything that we want to and indeed, we have struggled to achieve anything in some areas, we are making progress. Slowly, but surely."

CEO REPORT

"Our hard work is paying off. In the past 12 months we've achieved a 5% increase in our membership. People see RAAus as a real alternative. We are safe, professional, and growing fast. We have had fewer accidents, serious and fatal especially, than last year. We have more Sport Pilot subscribers. We have again reduced our financial deficit, and the future is looking bright in this regard. More members are willingly reporting occurrences to us, thank you! This data and information is invaluable in our continuous improvement cycle. We've attended dozens of member forums and engaged with over 2,500 members face to face. Visits included a number of very remote locations as well as a number of local venues. We continue to visit our members and have some exciting plans for 2018 to ensure this engagement continues."

STRATEGIC PLANNING

Over the past 12 months we have focused on our proposals for access to controlled airspace and increased weight. The process, while slower than we hoped, is progressing. We have met with CASA a number of times, provided additional information and continue to liaise with a view to an outcome in early 2018. In addition to the above two activities, the Directors have also been focusing on other strategic areas. These have included: • Exploring ways to improve member services and member engagement; • Tapping into technology and improving access to our members; • Developing a range of learning and development tools for members to improve their knowledge; • Exploring better ways of marketing RAAus to the broader community; • Providing our schools with

Some empty chairs

> "There's a palpable mood within RAAus ranks that things are under control"

more tools to enhance their business potential. As part of these strategies, members will be engaged to further gain insight into the types of things that will enhance the membership experience. Two crucial things remain central to our strategic planning. First and foremost are our members — everything is done with our members in mind. Second is securing the financial future and stability of RAAus. We are coming out of a series of annual financial deficits and have structured RAAus in such a way so as to see a balanced budget in the 2017 to 2018 financial year."

CTA AND MTOW

A detailed application for RAAus members to access Controlled Airspace (CTA) and gain an increase in Maximum Take-Off Weight (MTOW) for aircraft was provided to CASA late last year, with a positive and receptive response. We have since had a number of meetings and interactions with CASA staff in the interim to further progress the application. Once approved, we will roll out access to CTA for members in a managed and progressive method. This will ensure access initially to those members already qualified for CTA access and to assist RAAus manage the expected volume of applications, conversion of existing qualifications and assurance of the standards of our Instructors and CFIs. Likewise for the MTOW increase, a phased and carefully managed process is required to ensure the Instructors and CFIs are effectively teaching considerations for aircraft loading, take-off and landing performance and inflight management for heavier aircraft. These changes will effectively result in RAAus managing three distinct areas of member interest and as a result a one size fits all approach will no longer be the most effective way for this to occur. In basic terms, there is the genuine ultralight pilot, who wants to fly a single seat aircraft in their local area, possibly from a private strip, with minimal rules and bureaucracy. For these members we are developing an Ultralight Pilot Certificate (UPC). The UPC may seem like an oxymoron when we started as an organisation of pilots flying exactly these type of aircraft and flights, but it is in recognition of how we have evolved as an organisation and will continue to evolve. To quote Winston Churchill "To improve is to change; to be perfect is to change often." Then, we have the broader RAAus membership, who fly aircraft which are the envy of the GA world—sleek, fast, with glass cockpits, modern avionics and engines that run on the smell of an oily rag, matching the speeds of many GA basic trainers. There is not expected to be much change to the current requirements for these pilots flying up to 600kgs aircraft. Finally, we propose to introduce a new category called Group G for aircraft from 601kgs to 1,500kgs. For many GA pilots, the opportunity to move their aircraft to RAAus will be appealing and it will be a relatively simple matter to recognise their CASA Licence and convert to a Group G RAAus Pilot Certificate, requiring only a driver licence medical. Likewise, any Instructors or higher approval holders who have GA instructor qualifications or significant PPL time will be readily approved to train in Group G aircraft. Strategically, these three potential streams of activity within RAAus are being presented to the Board in an effort to effectively manage these diverse member requirements and provide assurance that all member's interests are being protected. "

An enduring eye

BY THE RAAUS BOARD

ALAN Middleton took up his place as a Director of RAAus Ltd at the September AGM.

Alan, like each of the Directors, is committed to act for the sole benefit of members. The membership base is representative of the many different pursuits now available in the recreational and sport aviation sector. The future of that space is also more varied now than ever. No doubt it will become even more complex and varied in the future.

A common and repeated theme heard over the past few months is that RAAus is forgetting its past. This is a reference by many that the root of our existence was the Australian Ultralight Federation and the low technology, 'freedom' flying machines of the time. The environment back then was one of low levels of regulation, of hundreds of small clubs run by enthusiastic volunteers who provided relevant and safe technical and practical advice to young and older aviators.

The physical representation of that era was, for many of us, the Scout aircraft and the presence of knowledgeable volunteers such as Ray Hawkins. Ray was a RAAF engine fitter who was a pioneer of the Scout at Donnington Air Park near Townsville in North Queensland (Type 'Ultralights in Donnington' into the Youtube search bar and enjoy those days again). RAAus was born from the efforts and lobbying of these pioneers.

As Alan will no doubt report to you, he's discovered the board has definitely not forgotten the past. Our ability to fly these early types, and their improved versions, to the present day, has not been interfered with or restricted. Indeed, we have achieved increased freedoms over the years.

The unique foundation delivered by the establishment of the AUF has been expanded to allow greater certainty for sport and recreational aviation. Without this administrative certainty, the threat of oppressive intrusions by agencies such as CASA and the ATSB is ever present.

The organisation now must cater for an ever-widening spread of aircraft types and technologies. Some have reasonably asked why we 'must' interest ourselves in these newer, high performance types. They yearn for an organisation which remains solely focused on its AUF beginnings. They want a return to the simple days. The fact is, we have not lost our focus on keeping things as simple, and as inexpensive, as possible.

The organisation must survive and grow stronger just to keep up with the unrelenting pressure from the political and bureaucratic institutions. Unless we remain vigilant and develop appropriate responses to the regulatory and political environment in which we exist, our social licence to operate will end.

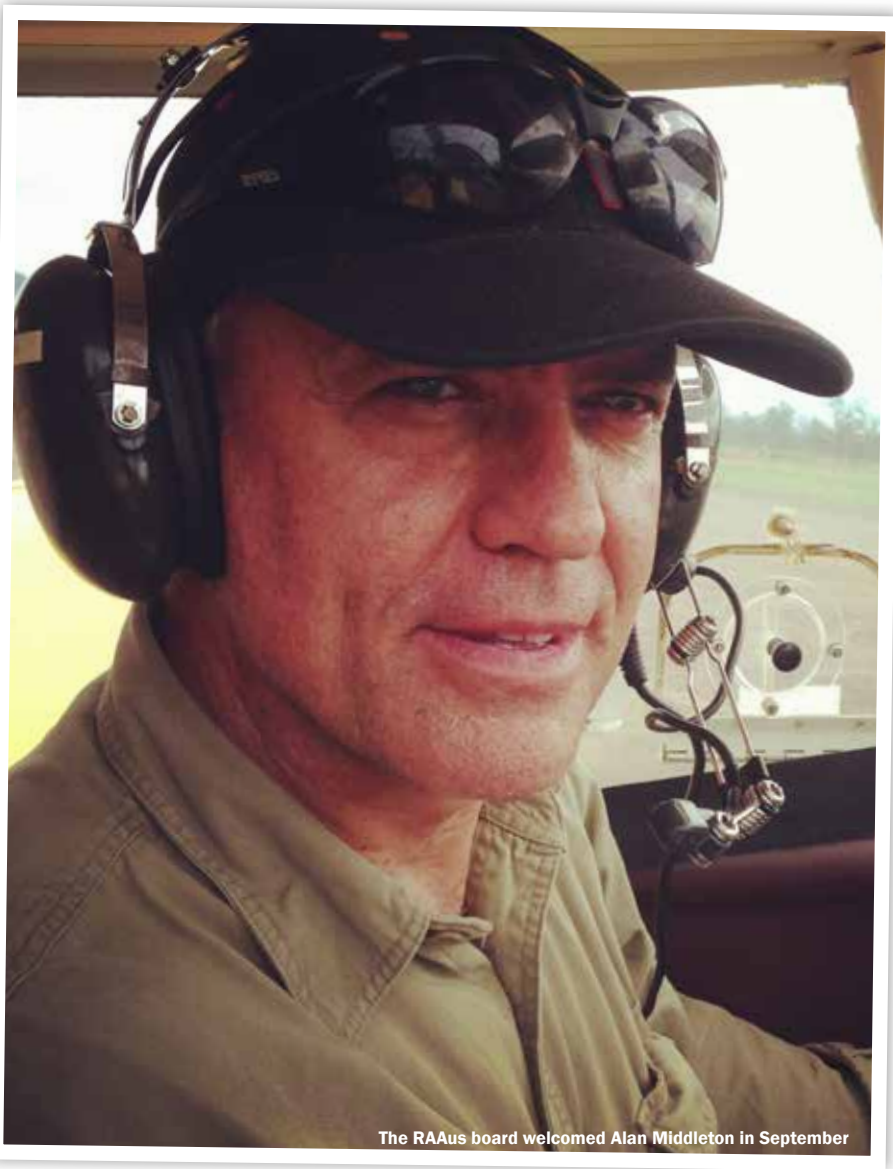
The changing environment for recreational and sport aviation is unending. The price of maintaining our freedoms is an enduring eye to constant development of strategic responses in a proactive, rather than reactive, way.

Alan is proud to now be a part of that, alongside the people who built RAAus from the beginning.

All the members of the Board intend to act with integrity and intelligence, as did those who served before us, to ensure the sustainable and effective performance of the organisation.

We focus on managing costs and earning sufficient income to balance the organisation's financial sustainability. We work with all relevant stakeholders to achieve appropriate levels of governance to ensure Australia is internationally recognised as a leader in the facilitation of recreational and sport aviation activity. We oppose the imposition of restrictions which do not have a sound, evidence-based foundation. We are vigilant in adopting reasonable risk/benefit analysis as an essential component of all rules and restrictions.

Perhaps most importantly, we work closely with RAAus' highly capable staff to ensure members, no matter what they fly, can pursue aviation in confidence. We must ensure that the investment by members, in time and money, will keep its value as part of a self-regulating organisation which maintains the trust of the public at large.



The RAAus board welcomed Alan Middleton in September

A QUESTION OR TWO

TEST YOUR AVIATION KNOWLEDGE

1 **Wash out is used to achieve which of the following?**
A. Improve stall characteristics.
B. Reduce induced drag.
C. Improve the lift/drag ratio.
D. Improve the rate of climb.

2 **Having flaps lowered whil climbing at Vy (best rate of climb speed) will result in which of the following?**
A. Diminished lift/drag ratio and increase rate of climb.
B. Increased lift/drag ratio and diminished rate of climb.
C. Diminished lift/drag ratio and diminished rate of climb.
D. Increased lift/drag ratio and increased rate of climb.

3 **In a steep slipping turn to the left, the balance ball will be?**
A. Out to the right of centre.
B. Out to the left of centre.
C. In the centre.
D. It could be out to the left or the right depending which side any imbalance is on.

4 **A pilot, flying in the morning, sets the altimeter to read the airfield elevation and sees the subscale reads 1016 hPa. On a later flight that day, he resets 1012 hPa to read the correct airfield elevation on the instrument. If the temperature has been constant, what change has occurred to the density altitude?**
A. The density altitude will remain unchanged.
B. The density altitude is higher.
C. The density altitude is lower.

5 **Given left mail wheel weight = 172kgs, the right wheel weight = 171kgs, and the nosewheel weight = 83kgs, what is the position of the centre of gravity if the main wheel arm is 1887mm and the nose wheel arm is 710mm?**
A. 2597.31mm aft of the datum.
B. 1177.31mm aft of the datum.
C. 1657.67mm aft of the datum.
D. 1463.88mm aft of the datum.

ANSWERS
1.A 2.C 3.B 4.B 5.C

Source: Brisbane Valley Flyer

Sport Pilot is still looking for a quiz writer. If that's you, contact editor@sportpilot.net.au

2017 RAAUS SCHOLARSHIP WINNERS

BY MICHAEL LINKE **CEO**

RAAUS, AIRSERVICES AUSTRALIA AND OZRUNWAYS AWARDED A RECORD AMOUNT IN GYFTS SCHOLARSHIPS THIS YEAR. AT A CEREMONY AT RAAUS HEADQUARTERS IN SEPTEMBER, SOME OF THE $72,000 ALLOCATED THIS YEAR WAS PRESENTED TO THE WINNERS. THE BOARD AND STAFF OF RAAUS CONGRATULATE ALL WINNERS AND HOPE YOU ENJOY YOUR NEW WORLD OF FLIGHT.

THE AWARDS WERE PRESENTED BY RAAUS CHAIRMAN, MICHAEL MONCK (L) AND ALISTAIR COE, LIBERAL LEADER FOR ACT (R)

Complete list of winners

Jarrod Smythe

Joshua Milton

Martin Castilla

RAAUS

Bryce Bell
James Chester
Joshua Chisholm
Jayden Collins
Hannah Dobbin
Bradley Leksas
George McFarlane
Joshua Milton
Patrick Montgomery
Charlica Schnitger
Jarrod Smythe
Katelyn Burrell
Joshua Colavecchio
Chiara Davies
Charli Ditchfield
Lachlan Holmes
Fintan Lennon
Evan Reinke
Georgia Semmens
Freya Swinbourne
Amy York
Monique Van As

Adelaide Pilt

Tolina Davis

Maxine Milera (for 10 years of service to RAAus)

Mitchell Willemse
Jake Webster
Sam Cottingham
Christina Waterhouse
Maurice Gregory
Martin Castilla
Gowrie Waterhouse
Melaine Cummins
Scott Crew
Tristan Sigley
Samantha Clark

AIRSERVICES

Thomas Winter
Breydon Verryt-Reid
Charlie O'Grady
Adelaide Pilt
Matthew Riddle
Patrick Sebire
Sophie Jennings
Tolina Davis
Nathan Barnes
Zac Burton

CARL HOLDEN

1952 - 2017

HE WILL BE MISSED

BY GEOFF RAEBEL

AT the end of a day's flying, it is easy to remember Carl Holden. Usually late on a Sunday he would stop by at Sydney Recreational Flying Club to ask how things were going. I didn't meet Carl until about 1993. Bill Dinsmore was the relieving CFI for those first two years. I suspect Carl was almost like a flying-son to Bill, they both came out of the gliding fraternity. He was very forgiving, not bashing low-time pilots for stupid errors - unless they repeated them. Eventually I got to know Carl as a friend. He was a very private person, but he was a legend in SRFC. He helped stop Telstra building a mobile tower in the runway splay area at The Oaks.

In some ways Carl was a loner and my wife and I were pleased one year to have him for Christmas lunch to help make the day special for my wife's 92 year-old uncle. Carl was gentle and understanding with the old-boy. I once asked someone how my VW powered 95-10 sounded from the ground. "Just like the CFI's Kombi!" was the reply. In the 1990's, Carl almost lived in his Kombi.

He is one of the instructors who sits on my shoulder every time I take up a student of my own - to pass on what he taught me.

Carl's legacy - 32 years, two LightWings, two Foxbats and hundreds of students

SERVICE TO OTHERS

BY GREG DAVIES

CARL was a teacher, an innovator and inventor. He spoke well of most people and rarely did he have a bad thing to say about another person. When friends asked for assistance, he never turned them down. Instead, forking out fortunes to help them and not complaining when things didn't pan out the way he'd hoped. Carl was a big dreamer and it was those dreams which defined him. Many of those dreams became manifest. They didn't make him rich but they defined who he was and made others richer for knowing him.

Carl had a tendency to get sidetracked. His mind never stopped ticking over and he always had a bigger and better idea than the one on which he was currently working. He had more projects stored away in files and boxes, and in the back of his mind, than could ever be accomplished in a single lifetime.

Carl was a founding member of the Sydney Ultralight Flying Club in 1985. At that time he was a tug pilot with the gliding club at Camden. It was on his advice the club bought its LightWing.

Carl was a kind and gentle man without ego. He was always willing to help anyone with anything and was an absolute asset to SUFC and many other clubs. He guided the club and mentored its members with safety as number one priority. He did this as a volunteer for over 20 years.

There are two kinds of people in this world. Those who are 'service to self' and those who are 'service to others'. Carl was definitely the latter. Always trying to assist other people - whether it was wanted or not. Carl's heart was big and his desire to help others even bigger.

I'm not sad of his passing because I know he is now released from the painful last months he endured in a failing body which trapped the mind and conscience of a brilliant loving being.

My condolences to Carl's sister Dianna who tirelessly nursed him through his last days and Carl's family who will miss him. To everyone who knew Carl, keep in mind he planned to keep an eye on you and that his service to others doesn't cease just because his time on earth has.

Realising the vision

BY KYLE LEE

FOR years, I watched in amazement as my father-in-law, Captain Alan Searle, built his Vans RV-8.

It was, at the time, unfathomable to imagine that a person could build their own airplane. As the years went by, and the enjoyment of sport aviation became apparent, I promised myself I'd have a crack at it someday. That someday came sooner than I thought because I was able to convince Alan to help me build an RV-12 (He probably felt obliged to keep an eye on a son-in-law who has no problems biting off more than he can chew).

In May 2011, absolutely the most time poor part of my life, we started the journey. Four years, 2,200 shop hours (it's not a race) and over 11,000 rivets later, 19-9112 became a reality. Here she is slipping the surly bonds for the first time in June 2015 out of YKTN with Alan test flying.

> "Thanks RAAus for helping me realise this vision

So after the build, what came next was quite natural - I learned how to fly in it. In April 2016, I started my RAAus Pilot Certificate. Over a year later, I now have my passenger and navigation endorsements and have logged over 100 hours.

Thanks RAAus for helping me realise this vision.

Picture: Slipping the surly bonds

Due regard to the weather

BY DAVE KING

I HAVE procrastinated over whether or not to write this and own up to the event.

I'm one of those people who, when I see on TV or read about someone coming to grief in bad weather, sum up in my own mind about what went wrong and say to myself "I would never do that". I'm a safe forward-thinking pilot with 1,600 RAAus hours. But I did do the same thing! I was lucky, very lucky. I got away with it.

It started with one of the events which had been on my bucket list forever. To attend the Old Station fly-in at Raglan. Some mates and I hatched a plan to go there this year. A few dropped out and one had engine problems, so it ended up just me in my Rans Venterra and two mates in a Jabiru J230.

I flew from Holbrook to Wollongong, met up with the Jab and off we went. Cowra, Parkes, Narromine, Narrabri, Moree, Goondiwindi, Dalby, Gayndah and Bundaberg (mandatory Jabiru factory visit when you are flying with two Jab pilots). Overnight, then onto Raglan, 2 1/2 days in total.

After a great weekend, my Jab friends had to leave before me. I stayed one more night then left on Monday morning. I had planned to tick off another bucket list item, to fly coastal back to Wollongong then over the range to Holbrook. Bad weather put paid to that idea. I was also apprehensive to do it solo, so I set course for Gayndah and familiar territory. Approaching Dalby, I saw a storm coming at me from the west, so I landed, tied down and stayed overnight. By mid-afternoon next day, I made it as far as Narromine in marginal weather, so I stopped and tied down again.

The next day dawned bright and clear. On checking the weather, I could see there was a front coming into south western NSW. I thought it would slide into Victoria, which happens a lot at that time of year. Wrong as it turned out.

About 20 miles from Forbes, I could see a grey line to the south west. It didn't appear threatening, so I pushed on to Temora. I have flown from Narromine to Holbrook many times, so I know the way like the back of my hand. My head was programmed to get home.

By the time I made Temora I had been in light rain for a while, but the cloud was still reasonably high and visibility was okay. But just okay. So I stopped, caught up with friends for coffee and chatted a while. There was plenty of daylight left and I knew I had only an hour and twenty left to run. During this break, the weather seemed to improve and a check on the internet showed only a small shower near Culcairn, to the west of my intended track. We said our goodbyes at my friends' hangar door with the usual closing line that I would return to use the hangar and a bed if the conditions deteriorated. By the time I reached Junee, I was already lowering my altitude and skirting around showers and low hills. I was very relieved when Wagga Wagga airfield appeared. I could have landed there quite easily but then a severe case of get there-itis set in. I could see over the hill south of Wagga and knew Holbrook was only 35 miles away, over country with which I was very familiar. So I crossed the hill.

Almost immediately I flew into the murk, so made the decision to turn around. I distinctly remember my face flushing and I started to sweat. The door behind me had been closed by incoming weather.

I swore out loud and it took a few moments before I gathered myself and began looking for the Holbrook/Wagga road. There are several ag strips in that area, but trying to find one was out of the question because there had been regular rain in the region and the entire country was green. Fighting to stay visual, I spotted the township of Mangoplah and picked up the road. Somewhere to the south of Mangoplah I knew there was a huge transmission line which runs from Wagga towards Henty. It would have been at about my altitude but I never saw it (thankfully). The cloud base was lowering even more and I lost the horizon for the first time. I don't mind admitting I was very, very frightened and felt sick in the stomach.

Several times I found myself at tree top height with things going past my nose very quickly. The second time I lost the horizon, I also lost the road and literally couldn't use the iPad to navigate because it was impossible to take my eyes away from what was ahead. Just then I saw a clear paddock, so I slowed down, added flap (which in hindsight I should have done earlier) and circled. I saw the sheep were in a top corner and all the cattle in the next paddock over. After a short downwind, base and final I lined up for an uphill landing. I was too high and too fast and touched down about halfway along. Brakes helped to slow the plane down, but the surface had been ploughed and was wet. I was headed for a cattle trough, so I switched the engine off and tried to ground loop. That doesn't work when you have a castering nose wheel. Somehow I missed the trough and ran into a wire fence while still going about running pace.

I can remember sitting there in the silence for several minutes gathering my thoughts. Then I climbed out. I also remember thinking how quickly it had all happened. And that I was so relieved to be on the ground I couldn't care less about the damage to the plane.

I had been lucky in that regard. I had hit the fence midway between two posts and the wires had acted like arrester cables. Because the engine was stopped, one blade had caught a vertical strand and wound itself into the wire matrix. As a result, I had one small nick and a radial scratch on the spinner. All I had to do was wind the prop in reverse and push the plane back and away from the fence.

By this time it was raining steadily. I was wet and the what if's had been going through my head. I tied down the plane, took some of my luggage, put the canopy cover on and headed across two paddocks to the road where I hitched a ride to Holbrook airfield. I had come up short by about 10kms. My sleep that night was broken.

The next day dawned perfect. Clear skies and a light wind, so with the farmer's help, took out as much weight as we could (including the passenger seat). I conducted a thorough check and convinced myself there was no reason not to attempt a take-off. The wind was blowing across the paddock which was also across the furrows. It was a bumpy take off run but surprisingly the Rans lifted quickly and almost instantly doubled its speed. Five minutes later it was in the hangar. I spent the next week going over every inch of it for damage.

I came very close to killing myself. It was bloody scary. I ignored so many opportunities to get out of the situation and I can't honestly really explain why. Please don't repeat my mistakes, I was very lucky.

FROM JILL BAILEY I was the friend Dave called in to visit at Temora. My husband, Norm, and I were quite worried about his decision to depart when he did, because we saw from the radar that showers were moving into the area. Hence our offer to put the aircraft into the hangar and give Dave a room for the night. Dave's story is an example of a variety of Human Factors. After a flight of over 1,800nms, he got into serious trouble just 5nms from home. Being close to home is no guarantee of a safe outcome. Hours and years of experience mean nothing if you don't carefully plan a flight with due regard to weather.

DREAMING ELECTRIC DREAMS

BY BRIAN BIGG

THE world owes a big debt to American billionaire Elon Musk.

Almost single-handedly, the co-founder of Paypal has forced us to embrace alternates to fossil fuels – first through his electric car company and now his Tesla battery. Before Musk, the conversation was "it would be nice someday to move to solar". Because of him, the conversation in most countries is now "we can't be last to move to the new energy sources, so we have to act now". He started the wave and pushed it all by himself for years and years, until it gained momentum. Now it appears unstoppable and companies all over the world are jumping on board. Other than your coal sponsored dinosaurs like Tony, who appear to be waiting for another comet to hit, there are few people who don't look forward to Elon Musk's future of cheap electric cars and homes which provide their own cheap power.

It's difficult now to remember why Musk had such a hard time convincing everyone alternative energy would be better. When cars first came along, horse owners no doubt shook their heads and thought to themselves "it will never catch on. Cars are so expensive and they break down all the time". But cars were so much more efficient than horses which, despite the fact they had been the world's primary transportation devices for millennia, were so quickly sidelined that, within a few short years, they were banned from public thoroughfares. It's the same discussion pilots are now having about the use of satellite navigation, instead of maps. When a technology comes along that is so much more efficient and effective than what is in vogue, the market place will move and move quickly, regardless of what the regulators and those with vested interests, might want to preserve. The powers-that-be have no alternative than to try and catch up. In the textbooks, it's called 'disruptive affordability'. Think mobile phones and the internet.

Aeroplane engines are on the edge of that same precipice.

Just after Christmas a US company is expected to begin deliveries of a two-place electric powered aircraft for use in flight training.

The Sun Flyer, designed by Bye Aerospace, in Colorado, will be the first FAA-certified all-electric trainer aircraft under FAR Part-23 (The company is also planning to certify a four seat IFR-capable version).

Why is it generating such interest? Disruptive affordability. The company says the Sun Flyer will use just $3 worth of electricity an hour and have

a total operating cost under $20 an hour. That's a fraction of the cost of even the cheapest aircraft operating now. Horse owners get off the road.

Bye Aerospace founder, George Bye, explains. "When you first sit in the cockpit of an electric-powered airplane, you see nothing out of the ordinary. However, touch the start button and it strikes you immediately: an eerie silence. There is no roar, no engine vibration, just the hum of electricity and the soft whoosh of the propeller. You can converse easily with the person in the next seat, without headphones. The silence is a boon to both those in the cockpit and those on the ground below.

"You rev the motor, not with a throttle, but a rheostat, and its high torque, available over a wide band of speeds, is conveyed to the propeller directly, with no power-sapping transmission. The motor only weighs 25kgs so it can be held in two hands. It measures only 10cms deep and 30cms in diameter. An equivalent internal-combustion engine weighs about seven times as much and occupies 120 by 90 by 90cm. With one moving part in the motor, an electric aircraft also costs less to maintain and less to buy in the first place.

"The Sun Flyer has been designed for the niche application of pilot training, where the inability to carry a heavy payload or fly for more than three hours is not a problem and where cost is a major factor. But we believe pilot training will be just the beginning of electric aviation. As batteries advance and as engineers begin designing hybrid propulsion systems pairing motors with engines, larger aircraft will make the transition to electricity.

"I will never forget my first experience with electric propulsion, during the early days of Tesla Motors, in the mid-2000s. I was a guest, visiting Tesla's research warehouse in the San Francisco Bay Area, and there I rode along with a test driver in the prototype of the company's first Roadster.

Looking over the electric components then available—the motor was large and heavy, and the gearbox, inverter, and batteries were all relatively crude—I found it hard to imagine why anyone would take an electric car over a gasoline-powered one. But then the driver's foot hit the accelerator, the car lunged forward like a rocket, and I was a believer.

"Electric flight has progressed on the backs of three advances in particular. The first is improved lithium-ion batteries. The second is efficient and lightweight electric motors and controllers. And the third is aerodynamic design—specifically a long, low-drag fuselage with efficient long-wing aerodynamics, constructed with a very lightweight and strong carbon composite.

"Our first project was the Silent Falcon, a 14kgs solar-electric fixed-wing drone. Our next was an electric propulsion system for use in an existing full-size airplane: the Cessna 172 four-seater, the most popular airplane in the world. After flying the converted Cessna for a few dozen short hops, we followed up with a purpose-built, single-seat electric airplane. We've taken each of these test planes on 20-odd test flights.

"Our first problem was finding a suitably light, efficient motor. Years ago, we encountered aviators who considered dropping (or actually did drop) a conventional electric motor into an airplane. But it weighed too much because of the heavy motor casings, the elaborate liquid-cooling systems and the complex gearboxes. Our approach has been to work with companies which have designed electric motors specifically for aerospace applications.

These aviation-optimized motors differ in several respects from the conventional sort. They can weigh less because they don't need as much starting power at low revolutions per minute. An airplane has far less inertia to overcome while slowly accelerating along a runway than a car does as it kicks off from a stoplight. Aviation motors can dispense with the heavy motor casing, because they don't need to be as rugged as auto motors, which are frequently jostled by ruts and potholes and stressed by vibration and high torque.

"In a Tesla, the power might peak around 7,000rpm, which is fine for driving a car. But when you're turning a propeller, you need the power curve to peak much sooner, at one-third the revs, about 2,000rpm. It would be a shame to achieve the shape of that power curve at that lower speed by adding the deadweight of a complex gearbox; therefore, our supplier furnishes us with motors which have the appropriate windings and a motor controller programmed to deliver such a power curve. At 2,000rpm, the motor can thus directly drive the propeller. As a result, we've been able to progress from power plants which developed just one or two kilowatts per kilogram, to models generating more than five kW/kg.

"Even more important was the lithium-ion battery technology, the steady improvement of which over the past 15 years was key to making our project possible. Cuurently, we use a battery pack composed of LG Chem's 18650 lithium-ion batteries, so called because they're 18mms in diameter and 65mm long, or a little larger than a standard AA battery. LG Chem's cell has a record-breaking energy density of 260 watt-hours per kilogram, about 2.5 times as great as the batteries we had when we began working on electric aviation. Each cell also has a robust discharge capability, up to about 10 amperes. Our 330kgs battery pack easily allows normal flight, putting out a steady 18 to 25kW and up to 80kW during takeoff. The total energy storage capacity of the battery pack is 83kWh.

"That peak power rating is generally most needed toward the end of a flight, when the state of charge drops and voltage gets low. Just as important, the battery can charge quite rapidly; all we need is the kind of supercharging outlets now available for electric cars.

SUN FLYER SPECIFICATIONS

TOTAL OPERATING COST PER HOUR USD$16.00
SEATS 2
CABIN WIDTH 1168mm
WING SPAN 11.5m
WING AREA 11.9sqm
GLIDE RATIO 21.5
GROSS WEIGHT (US) 861kgs
PROPULSION 80kW
BEST RATE OF CLIMB 1,450fpm
NORMAL SPEEDS 55-120kts
ENDURANCE 3 hours

Prototype Sun Flyer


Sun Flyer cockpit

> There's little doubt that when the Sun Flyer hits the market, things are going to change quickly.

"To use lithium-ion batteries in an airplane, you must take safety precautions beyond those required for a car. For example, we use a packaging system to contain heat and at the same time allow the venting of any vapours which may be created. An electronic safety system monitors each cell during operations, avoiding both under- and overcharges. Our battery-management system monitors all these elements and feeds the corresponding data to the overall information-management system in the cockpit.

"Should something go wrong with the batteries in flight, an alarm light flashes in the cockpit and the pilot can disconnect the batteries, either electronically or mechanically. If this happens, the pilot can then glide back to the airfield, which the plane will always be near, given that it is serving as a trainer.

"A key precaution, pioneered in the Tesla Roadster, is to separate the individual cells with an air gap, so if one cell overheats, the problem can't easily propagate to its neighbours. Air cooling is sufficient for the batteries, but we use liquid cooling for the motor and controller, which throw off a lot of heat in certain situations (such as a full-power take-off and climb-out).

"The airframe design takes advantage of advanced composites, which allowed us to produce a wing and fuselage design that is both lightweight and strong. We used advanced aerodynamics design tools to shape the fuselage airfoils and wing for a very low drag without compromising easy handling.

"Much of the aerodynamic payoff of our electric propulsion system is centred in the cowling area in the nose. The motor sits in this space, between the propeller and the cockpit, and it is so small we could squeeze the cowling down to an elegant taper, smoothing airflow along the entire fuselage. This allows us to reduce air resistance by 15 percent, as compared with what a conventional plane such as a single-engine Cessna. Also, because the electric motor throws off a lot less heat than a gasoline engine, you need less air cooling and thus can manage with smaller air inlets. The result is less parasitic cooling drag and a nicer appearance.

"The sleek airplane nose also increases propeller efficiency. On a conventional airplane, much of the inner span of the propeller is blocked because of the large motor behind it. In a properly designed electric airplane, the entire propeller blade is in open air, producing considerably more thrust. The airplane can also regenerate energy during braking, just as electric cars do. When the pilot slows down or descends, the propeller becomes a windmill, running the motor as a generator to recharge the batteries. In the sort of airport traffic pattern typical for general aviation and student-pilot training, this energy savings comes to about 13 percent. In other words, if a plane lands having apparently used 8.7kWh during the flight, it has actually used 10kWh—the propeller-recoup system put back roughly 1.3kWh while flying in the traffic pattern".

The Sun Flyer aircraft will be certified according to standard-category, day-night visual flight rules with a target gross weight of less than 864kgs. The company expects a climb rate of 1,450fpm.

There's little doubt that when the Sun Flyer hits the market, things are going to change and change quickly. Again because of disruptive affordability. $3 worth of electricity an hour and a total operating cost under $20 per flight hour? At that price, it is easy to envisage a market place in a few short years where a flying school which doesn't use electric powered aircraft for ab initio training will find itself unable to compete on price. They might as well be using horses. And, just as a final comment, a generation of pilots trained using an electric powerplant, will undoubtedly demand one for cheap recreational flying too. Here comes the future, ready or not.

Wal Chapman flew up from Guyra in his pristine Jabiru J230

Doug and Robyn McCullough took just over an hour to reach Warwick from Caboolture in his Tecnam P2002 Sierra

PERFECT WEATHER

STORY AND PICS BY ALAN BETTERIDGE

Intrepid aviator Brett Poole flew over from Maryborough with a stop at Watts Bridge for extra fuel - just in case

Savannah touches down

THE weather forecast for Warwick listed fine days but cold mornings for the weekend, so it was with some trepidation I planned my trip to attend the biennial Wings over Warwick fly-in.

The plan was to camp using my new tent. But having had multiple failures at this camping caper, especially when it involved me doing it in cold weather, I had misgivings about tempting the camping Gods, who seem to hate me.

Luckily my beloved came to my rescue and decided she would come with me. This, of course, meant we would take our caravan, because there is no way in the world she would ever consider camping under canvas.

We arrived on the Friday and were invited to set up in the Warwick Gliding Club's camp area.

Power, flushing toilets and hot showers, all for just a $10 donation per night – what bliss.

A strong wind blew most of Friday, but by Saturday morning it had abated and clear skies set the scene for a perfect day.

As with all fly-ins, the event is more about the people than the aircraft and Warwick was to prove no different.

One of the first arrivals was Wal Chapman who flew up from Guyra in his J230 Jabiru.

Wal has owned the aircraft, which he built, for the past six years and is more than happy with it.

"It took me around 530 hours over 12 months to complete the construction. I was impressed with the quality of the Jabiru kit and the back-up from the Jabiru factory," Wal said.

Wal's aircraft is powered by a 120hp Jabiru 3300, six-cylinder engine which he said was the perfect match for his aircraft.

"The airstrip we operate from in Guyra has an elevation of over 4,000ft. During the summer months, it can have a density altitude of 7,000ft or more. So, having an aircraft with such a good power to weight ratio, makes good operational sense," he said.

"We have a C172 and Piper Warrior as well but, with that sort of density altitude, they really become two-seater aircraft.

"Although they have 150hp on tap, their power/weight ratio is far worse because of their higher weights".

What Wal said was correct of course, but I wondered how many LSA pilots give much consideration to the effect of density heights when operating from high elevation airfields during the summer months.

Another early arrival saw Doug and Robyn McCullough alight from their Tecnam P2002 Sierra in which they had travelled from Caboolture.

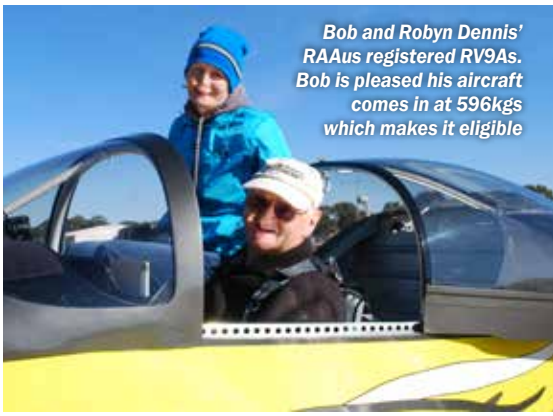
"We had a good, smooth trip over and it only took us just over one hour to do," Doug said.

Both were pretty well rugged up in jackets to

PERFECT FLY-IN

There is no mistaking a Savannah for anything else

Col and Donna Johnston made the trip down from Childers in the couple's Jabiru



Bob and Robyn Dennis' RAAus registered RV9As. Bob is pleased his aircraft comes in at 596kgs which makes it eligible

About to touch down - Bellanca 8KCAB

This pair of Sling aircraft drew a lot of admiring looks with their red and white paint jobs

combat the early morning cold, which I couldn't blame them considering it was still only about four degrees.

Doug gained his Pilot Certificate in 2007 and became co-owner of the Tecnam in 2009.

"Great little aeroplane," he said, "Cheap to operate, reliable and easy to maintain. Who could ask for more?"

Not long after talking to Doug, I noticed the eye-catching paint scheme of an RV9A – and it was RAAus registered.

This gleaming beauty was owned by Bob and Robyn Dennis from Watts Bridge. Slipstream Runner, as it was called, was built by Bob and first registered in 2011, after a bit of argy-bargy with the powers to be at RAAus at the time.

"They didn't want to have a bar of it," Bob said.

"It was their opinion it would be too heavy for the category but, as I pointed out to them, they already had one of the type on the register and, as such, they couldn't now say no to me.

"They were a bit hard to convince, but after some fairly heated discussions and the provision of a statement from Vans Aircraft advising that the type was LSA certified in the U.S and there was no reason it couldn't be registered here as an LSA, they relented.

"It is certified as a two- seat aircraft and, as such, I don't have rear seats fitted. It is the owner/pilot's responsibility to ensure it does not exceed 600kgs.

"Mine comes in at 596kg, so I have a whole 4kg still to use," he said with a wry grin on his face.

Our discussion came to an end when Robyn announced that, because Bob had dragged her out of bed so early, she was now starving and all further discussion could wait until after breakfast.

"I've learnt never to argue, so we will catch up later," he laughed as they both headed off to the breakfast tent.

Fellow Maryboroughites, Col and Donna Johnston, had travelled down from Childers, where they keep their Jabiru, to the Wings over Warwick event.

"We are always on the lookout for somewhere to go," Col said.

"Today's weather was just too good not to go flying," he added.

Donna agreed with her husband and added that the flight was lovely, with the exception of the large areas of smoke.

"It was smooth and overall we had no problems," she said. "I just love it when the weather is like this," she added.

Another attendee from Maryborough was Brett Poole who had made the trip in his Vans Courier S-7S.

"It took me a bit longer to get here than it normally would because I made the decision to land at Watts Bridge along the way to top up with fuel," Brett said.

"You just never know when the wind will get up at this time of the year, so I wanted that bit extra – just in case."

Brett was planning on going on to Tenterfield to meet up with some like-minded friends after he was finished in Warwick. Life is just full of opportunities when you have access to your own aircraft.

The fly-in attracted about 40 or so aircraft over the day and, as is normal with this style of country event, about 300 locals made their way to the aerodrome to inspect the aircraft.

This was my first visit to Wings over Warwick and it won't be the last. It is a single day event (on the Saturday) and has a special feeling about it.

Airshows are fine, but there is nothing quite like a well-run fly-in. There is always a feeling of comradery when aviation-minded people get together.

As for the cold weather? Sure was. Minus one degree on Saturday morning, but I didn't care. I was in the caravan, not my untrustworthy tent, thank God.

The getting of wisdom

VIEWPOINT

THE facilities were staggering. I had flown into a largish country town for a social event and had phoned the aero club the night before to ask about parking. The local CFI said he would be there to show me around.

The aero club also housed the flying school and there were all the usual briefing rooms, reception/ops, and kitchen/lounge area – but there were also multiple areas set aside for flight planning/NAIPS, simulator and memorabilia. The area was capable of holding a fairly significant social event too, with a large outdoor undercover area together with adjacent parking. I felt a bit envious when I remembered my own first flying school, which was a one room shed on a deserted airfield with one Chipmunk aircraft and one instructor.

Tell that to kids today and they wouldn't believe you. Anyway...

It got me thinking about economy of scale, overheads, teaching and viability – and of course about the venue for 'hangar talk', which is so much a part of how we learn and why we hang around airfields.

How do flying schools maintain economic viability? I asked my own local instructor why he instructed and he assured me it wasn't for the money, but for the love of flying and teaching. So why do so many local airfields have separate flying schools and aero clubs? Wouldn't it be better to share resources, both economically and for the social aspects of aviation? Would it then be possible to employ a LAME full time and share a hangar? Have a combined buying power and voice. Own the aircraft for teaching and cross hire.

Obviously, such combinations depend on the personalities of those concerned and the ability of the CEO. I recall such places as the late RQAC which went broke after a 100 years of successful operations. Why? What is the catalyst for success or failure if not economy of scale? Has the face of aviation changed so much? How did the flying school/aero club at which I now found myself succeed? I looked around as the CFI showed me his club and his school with great pride.

Everything was clean and orderly. He told me of the school's ability to get students solo in five or six hours by using the simulator and intensive ground training. Both the instructors and students we met seemed friendly and happy and I left feeling that I, too, had been well received and well instructed. Even if it was only for a tour of the facilities. And it dawned on me. It isn't about the economic cost and the catalyst isn't actually in the facilities. It's the people. It's us. Pass it on.


24-4422

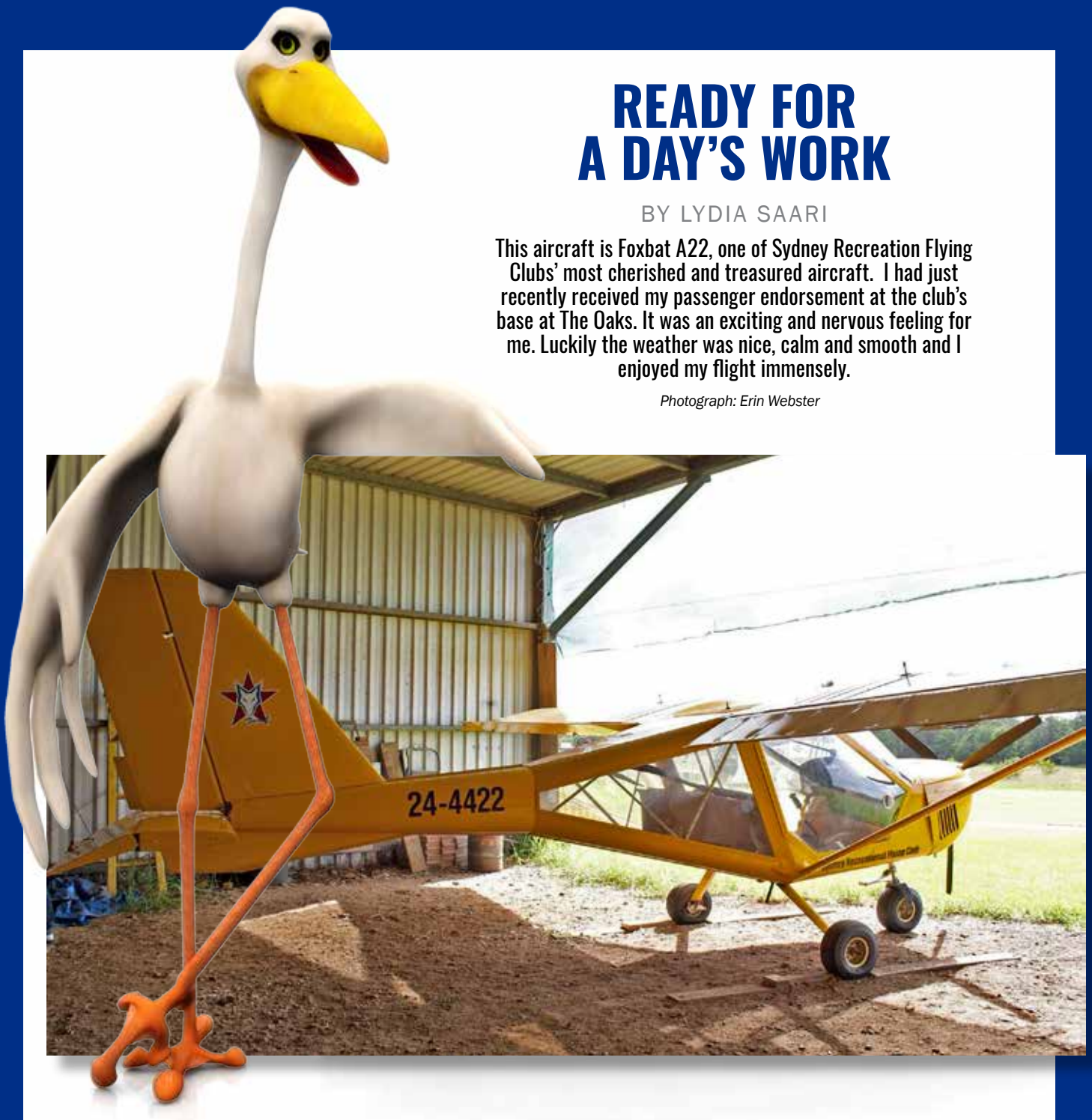

Recreational Flying Club

READY FOR A DAY'S WORK

BY LYDIA SAARI

This aircraft is Foxbat A22, one of Sydney Recreation Flying Clubs' most cherished and treasured aircraft. I had just recently received my passenger endorsement at the club's base at The Oaks. It was an exciting and nervous feeling for me. Luckily the weather was nice, calm and smooth and I enjoyed my flight immensely.

Photograph: Erin Webster



POSTER OPPORTUNITY

Want to see yourself or your aircraft larger than life on your clubhouse or bedroom wall?

Sport Pilot **is offering subscribers the chance to show off their favourite aviation photo in this double page centre spread of the magazine each month.**

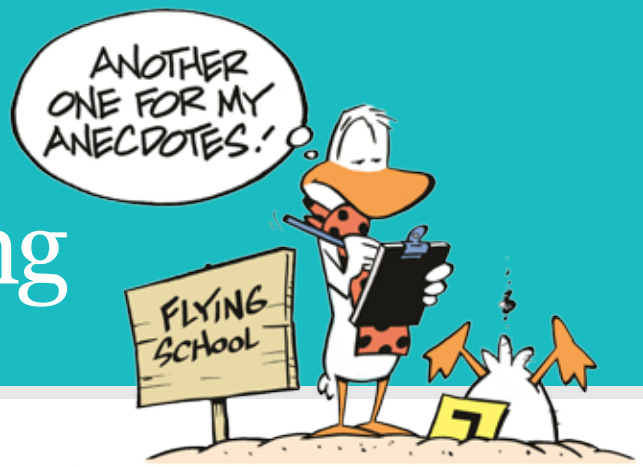
Each edition one photo will be chosen (We will try and make sure every photo sent in gets a run). If you are an aircraft seller, it's a great chance to show off your product.

If you have a fancy paint job, now is the time to show it off. And if you have a great photograph of you and your mates at a fly-in, it will make a good memento.

Send your photos (as separate jpeg attachments) to editor@sportpilot.net.au. It obviously has to be in landscape, not portrait, mode and be as big a file as possible please.

A cowling scowling

BY DAVID P. EYRE



A SERIES OF STORIES FROM FLYING INSTRUCTORS. THEY ARE DESIGNED TO BE EDUCATIONAL, AMUSING OR SERIOUS – SOMETIMES ALL THREE. THEY CARRY A MESSAGE ABOUT SAFE OPERATIONS.

I WAS recently reading an article in an aviation magazine which showed a photograph of a cockpit. There were maps and other junk resting on the instrument cowling. The photograph reminded me of the problems associated with this practice.

In 1955, I flew a Tiger Moth from Cambridge airfield to Western Junction airfield. Cambridge was the main airport for Hobart and Western Junction was the main airfield for Launceston. The purpose of the flight was to ferry another pilot to Western Junction to pick up an Auster J5B which was to be flown to Cambridge.

Flying on a cold winter's day in Tasmania can be delightful. Eight eights blue and no turbulence, and so it was on this day. Because our aero club CFI was in dispute with the Western Junction CFI, I did not muck around. I hurriedly refuelled, received my taxi and take-off light and departed for Cambridge. Our Tigers were fitted with specially designed sliding canopies to help protect against Tassie weather and they were very effective. They had to be opened on take-offs and landings in order to see the aircraft attitude (See photograph).

Because it was such a nice day, I opened the canopy shortly after take-off to enjoy the feel of the wind on my face. However, I had forgotten about the chart on my knees until it suddenly departed the aircraft with a disconcertingly loud fluttering which frightened the hell out of me. I had set my course on the P8 compass and had my flight plan on the Mark III knee pad, so I wasn't particularly worried but, of course, I couldn't do any groundspeed checks. If you fly anywhere in Tassie, you can practically see from A to B, so I eventually arrived safely in the Cambridge circuit, received my green light for landing and landed. The experience stuck with me over the years. I incorporated the lesson in my instructing on open cockpit aircraft, such as the Drifter.

I think it was about 1957 that I heard about a DC4 taking off from an airstrip in the Pacific. DC4 aircraft were not pressurised and, because the day was hot and steamy, the pilot had his side window open. His charts were on the instrument cowling and, as he became airborne, some of the charts flew out the open window. One flew up and blocked his windscreen. In his scramble to move it he inadvertently pushed on the stick and the aircraft touched down again and ran off the runway. If my memory serves me correctly, there was no damage except to the pilot's pride.

What I learned from these experiences was the danger of loose objects flying around the cockpit and especially being placed on the instrument cowling.

Another problem I often see, is the habit of pilots placing headsets on the instrument cowling. Invariably this brings the headsets close to the magnetic compass and in some cases they have even been wrapped around the compass. The real danger here is that the magnets in the headsets could cause a deviation to the magnetic compass.

The purpose of the instrument cowling is to provide a shade so pilots can read their instruments. It is not a resting place for charts, snacks, headsets or anything else.

Just maybe, one day, these objects may be a problem.

David welcomes your own aviation anecdotes.
Email them to editor@sportpilot.net.au

The canopies of the DH82 Tigers we flew in Tassie

BUYING MY FIRST AIRCRAFT

BY LUKE BAYLY

Holding the wing steady for me

SINCE I received my first issue of *Sport Pilot* back in 2008, I have always studied the classifieds and imagined owning an aircraft.

Nearly nine years later and I was still looking for something which might fit within my resources, enabling this dream to come to fruition. Over the years, there have been a couple of potentially affordable aircraft such as the X-Air or some of the smaller Jabirus but, while the purchase price of $12k-$25k might be achievable, the ongoing cost of hangars, overhauls and operating expenses has meant I have always returned to my local school to hire and fly. For me personally, the break-even point of value for owning an airplane is flying 30 hours per year, however I am barely breaking 20 hours which means hiring makes more financial sense.

So while perusing the Aviation Classifieds recently, I happened to come across a sleek looking aircraft called a Sonerai 2LS. I knew very little about it, but it had that most attractive of features, an affordable purchase price.

Off I went to the internet to research the performance specifications and general reviews on the type. It showed the aircraft had some impressive performance figures and a good safety record. It also had the added benefit of folding wings, so I could potentially bypass the hangar storage fees.

After thoroughly researching the aircraft, I got in contact with the sellers to begin my barrage of questions for details of the specific airplane. The resultant conversations started to paint a very clear picture of a well built and solid performing aircraft which could potentially be a very affordable way for me to build hours. But there were some minor obstacles. It needed some minor repairs, I would have to find a way to transport it from Jacobs Well, south of Brisbane, to Mackay and I would need to complete further schooling to receive my tailwheel endorsement.

The first order of business was to convince my partner to allocate funding from our small pile of savings. After some intense back and forth questioning and some compromises, we finally struck a deal to allocate some savings, as well as sell off a couple of other assets known as 'my toys'.

The next step was to enter negotiations with the current owners because the resources I could offer to purchase then restore the aircraft to flying condition, fell short of the asking price. The owners were the family of the aircraft builder who had just passed away, Harry Kurko, of Jacobs Well. They were very interested in seeing the aircraft back in the air as a reminder of Harry's love of flying. They told me they were keen to see the aircraft move onto its next chapter, rather than sit forgotten in a hangar. They accepted my proposal to resurrect the aircraft and ensure it returned to service as soon as possible. I plan to ensure Harry's legacy continues and will inscribe his name as the builder on the side of the aircraft to note its origin.

While the restoration has begun, there are still obstacles to getting the plane back into service. These include some repairs to the electrical and fuel systems, a modification to the engine plenum allowing for greater cooling properties and, most importantly, further training for myself for my tailwheel endorsement. In addition, due to my height and size, the cockpit interior will require some adaptation. The Sonerai cockpit was built for a smaller sized person, but will accommodate a larger pilot with some minor modifications.

Because I qualified for the L1 maintainer course online, I am able to complete most of the minor repairs myself and simply need to consult with the RAAus technical staff for any further support. There are however some additional costs to get the plane back in the sky, such as the transfer of registration ($65) which requires an L2 Condition Report. For peace of mind, I will also get a thorough inspection completed on the aircraft prior to the first flight to ensure all systems are fully operational.

I hope to report soon that the repairs have all been done and I will get to the first taxi and ultimately, the first flight in my first owned airplane.

Folding wings will save me money

> “The aircraft had some impressive performance figures and a good safety record

A snug cockpit for a two man crew

Doing the deal with Harry's son, John Kurko (R)

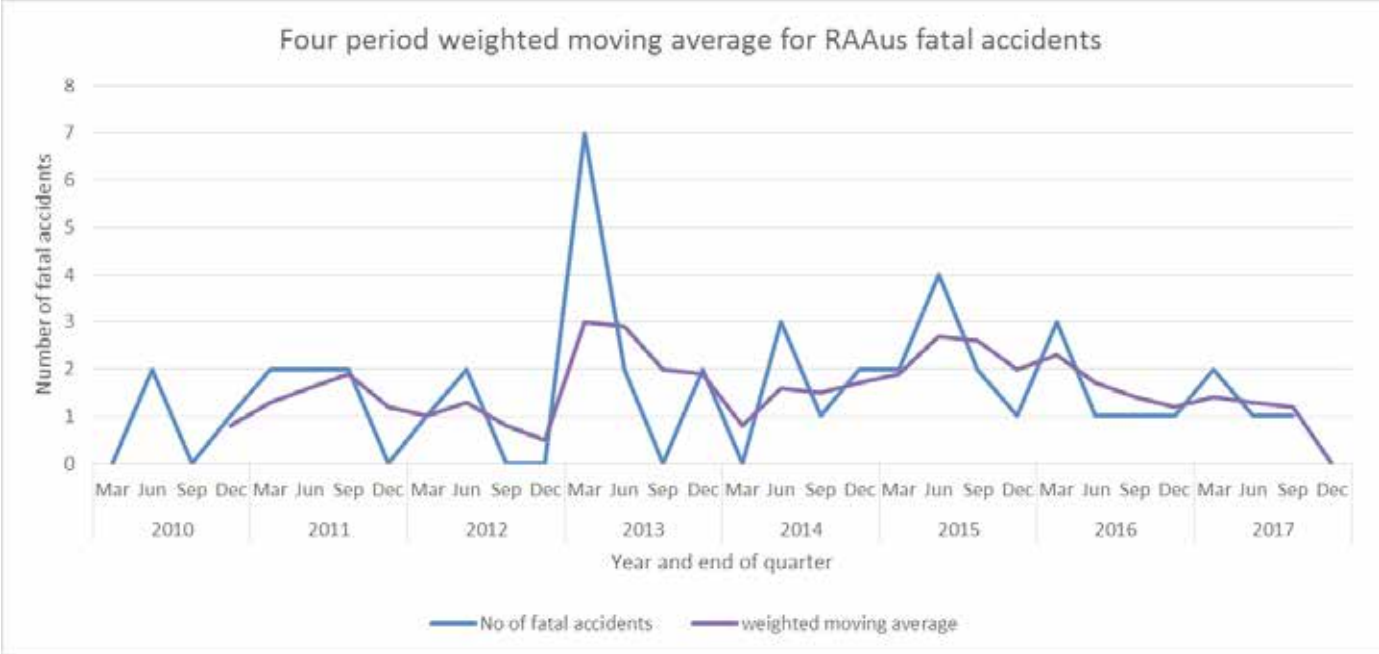
RAAUS BY THE NUMBERS

ALL ABOUT YOUR ORGANISATION

OCCURRENCES

Fatals (per quarter ending 30 June 2017)					
	30-Sep	31-Dec	31-Mar	30-Jun	TOTAL
2016–2017	1	1	2	1	5
2015–2016	2	1	3	1	7
2014–2015	1	2	2	4	9
2013–2014	0	2	0	3	5
2012–2013	0	0	7	2	9

Calendar Year Normalised Fatality Data			
Year	Fatalities	Hours	Fatals per 100,000 hours
2017	4	379646	1.05
2016	6	207,893	2.89
2015	9	211,431	4
2014	6	226,364	2.65
2013	11	243,637	5



ACCIDENT DATA

Accidents				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	13	15	20	9
2015–2016	18	15	10	9
2014–2015	23	22	29	26
2013–2014	13	32	29	32

Incidents				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	40	54	37	39
2015–2016	18	15	46	43
2014–2015	33	26	15	25
2013–2014	21	27	16	25

Defects				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	5	7	2	10
2015–2016	9	19	13	8
2014–2015	12	8	8	6
2013–2014	3	1	5	5

Hazards				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	3	4	2	1
2015–2016	9	19	5	2
2014–2015	0	1	1	3
2013–2014	0	0	6	8

Aircraft Damage 2016–2017				
	30-Sep	31-Dec	31-Mar	30-Jun
Destroyed	4	4	4	1
Substantial	7	9	9	10
Moderate	11	19	17	15
Mild	29	34	30	22
None	2	3	1	0
TOTAL	53	69	61	48

Aircraft Damage 2015–2016				
	30-Sep	31-Dec	31-Mar	30-Jun
Destroyed	1	1	6	2
Substantial	0	10	7	10
Minor	0	6	15	15
Nil	4	18	50	53
Unknown	0	3	5	4

Injury to Persons 2016–2017				
	30-Sep	31-Dec	31-Mar	30-Jun
Fatal	1	1	2	1
Serious	1	0	1	0
Minor	2	4	4	1
None	49	64	54	45
Unknown	0	0	0	1

ATSB Breakdown of Occurrences				
	2014	2015	2016	2017
Technical	72	39	64	71
Operational	45	46	108	111
Environmental	5	3	23	18
Airspace	6	5	30	29
Unclassified	0	0	7	3

MEMBERS

Membership numbers at points in time				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	8541	8610	8944	9049
2015–2016	8963	8565	8678	8594
2014–2015	9367	9154	9183	9117
2013–2014	9762	9648	9608	9447
2012–2013	9822	9913	9909	9832

Flying hours average			
Calendar year	Hours total	Membership numbers	Average hours per member
2017	379,646.70	9049	41.95
2016	207,893.30	8678	23.96
2015	211,431.90	9117	23.19
2014	226,364.80	9154	24.73
2013	243,637.70	9648	25.25

Members by State		
(as at 30 June 2017)		%
ACT	170	1.9%
NSW	2284	25.24%
NT	121	1.3%
QLD	2394	26.46%
SA	950	10.5%
TAS	224	2.48%
VIC	2291	25.3%
WA	572	6.32%
	9006	99.9%
Overseas	43	0.10%
TOTAL	9049	100%

New students				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	203	491	478	466
2015–2016	174	206	207	191
2014–2015	390	310	261	344
2013–2014	433	348	382	323
2012–2013	420	387	429	397

Gender comparison		
Financial Year	Males	Females
2016–2017	8474	575
2015–2016	8107	487
2014–2015	8957	618
2013–2014	9362	597
2012–2013	9627	606

SCHOOLS & CLUBS

Schools				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	165	163	163	164
2015–2016	168	166	164	163
2014–2015	171	169	169	171
2013–2014	168	172	169	171
2012–2013	167	163	168	168

Clubs				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	44	41	40	41
2015–2016	44	45	43	46
2014–2015	41	41	42	43
2013–2014	47	44	43	44
2012–2013	45	48	47	47

AIRCRAFT

3 Axis (A)				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	2827	2842	2831	2839
2015–2016	2795	2827	2875	2833
2014–2015	2756	2785	2808	2822
2013–2014	2644	2720	2721	2681

Weight Shift (B)				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	201	215	212	210
2015–2016	242	246	246	222
2014–2015	226	227	236	241
2013–2014	244	240	231	226

Powered Parachute (D)				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	221	200	201	206
2015–2016	227	229	232	212
2014–2015	211	214	222	220
2013–2014	197	210	186	203

Total				
	30-Sep	31-Dec	31-Mar	30-Jun
2016–2017	3249	3257	3244	3255
2015–2016	3264	3302	3352	3267
2014–2015	3193	3226	3266	3283
2013–2014	3085	3170	3138	3110
2012–2013	3567	3318	3301	3220
2011–2012	3385	3395	3285	3398

AIRCRAFT TYPES

Make	3 Axis
Jabiru	884
Thruster Aircraft	218
I C P	184
Tecnam	181
Austflight ULA	157
Aeroprakt	129
Skyfox Aviation	133
Howard Hughes Engineering	131
Zenith Aircraft	110
Rand	83

Make	PPC
Aerochute Industries	356
Home Built	34
Summit Aerosports	11
Powerchutes System International	12
AAA Fasterway	5
Fresh Breeze	5

Make	Weight Shift
Airborne	429
Solar Wings	47
Air Creation	16
Flylight	8
Dta Sarl France	5
Ramphos	6
Aeros	5
Evolution Trikes	4
Mainair Sport	2
Flyright Aviation	2

STATISTICS

Type	Calendar Year	2013	2014	2015	2016	2017
10	Hours	916.3	2260.3	2866.5	664.9	1609
	Landings	7266	4709	4123	111	231
19	Hours	28534.4	36489.7	50514	26221.8	38089
	Landings	51267	50147	77741	6657	6626
23	Hours	0	0	0	150	273
	Landings	0	0	0	1173	362
24	Hours	93305.5	117153	143740.9	85872.9	174725
	Landings	183981	261333	286641	10291	22584
25	Hours	4559.7	5692.3	11253	3163.4	7040
	Landings	21029	12594	23490	128	202
28	Hours	930.5	2071.9	3175.4	1770.7	1930
	Landings	2430	4977	2863	104	201
32	Hours	13167.3	16738.4	14750.2	4860.3	10094
	Landings	29894	33062	29084	1156	1746
55	Hours	9997.3	8332	10847.1	5529.8	11878
	Landings	32200	25682	26058	849	1701
TOTAL	Hours	151411	188737.6	237147.1	128233.8	247384.0
	Landings	328067	392504	450000	20469	33653

Who can be angry on such a nice day?

Gathering at Luskintyre

A breezy landing

Welcome indeed

Full house for the poker run

BY VINCE CASSANITI

BEFORE moving back to my hometown of Newcastle, I lived in Darwin for 12 and a half years and chose Noonamah as my home base.

I learned to fly there and gained my wings under instructor, Norm Turner.

I am now based in the Lake Macquarie area on the NSW Central Coast and within close proximity to Matt Hall's facility, Lake Macquarie airfield (formerly Aero Pelican) and approximately 55kms from Luskintyre and Cessnock aero clubs, smack in the middle of the Hunter Valley vineyards. Most weekends I have a dilemma trying to choose which airfield to visit.

During a recent visit to the Valley, I met up with Keith Rule, the local L2 from Cessnock Aero Club., who told me there was to be a Poker Run in September and asked me to join him. I took him up on it.

We set out from Cessnock on a beautiful cloudless day and tracked south/east over the Watagan mountain range and onto the spectacular Lake Macquarie. East of the ranges we had uninterrupted views of Lake Macquarie, north and south of the ocean coast line from Nobbys Beach lighthouse to Swansea bridge and beyond. What a magnificent sight.

Our first landing was at Warnervale on the Central Coast. After a meet 'n greet, we departed and tracked again over Lake Macquarie bound for the privately owned Luskintyre airfield, home to various warbirds and the largest fleet of operational Tiger Moths in Australia. Luskintyre airfield is approximately 4nm west of Newcastle Aero Club at Maitland. It's Paul Bennet's home base, along with his collection of stunt planes. Also within the facility is a great aviation museum.

> "I could have spent the whole day there

Before departing, we collected our next lot of cards and were treated to cake and coffee. I could have spent the whole day there. Finally, we departed for Mt. Thorley and Warkworth, abeam the huge coal mines in the upper Hunter Valley. Tracking westbound, we sighted our next waypoint at Denman and landed close by at Yarrawa private strip to collect our last lot of cards. I'd flown over the lush green Hunter Valley a few weeks earlier and it was hard to believe how parched the terrain had become.

On our return to Cessnock, I was surprised to see the large number of RAAus registered aircraft which had gathered, along with a gaggle of aerobatic planes including Paul Bennet's beautifully restored Grumman Avenger.

Adventurous pilots looking for a fly-in/fly away, I'd recommend a visit to all four airports because they each have things to offer. With summer just around the corner, the vineyards often have concerts involving well known artists. There are also many nice restaurants and cellar door wine tasting venues. Eight hours from bottle to throttle will be a difficult task.

Experience can be a killer

BY THE OPS TEAM

RAAUS members are often pilots who fly across numerous disciplines over a long period of time. They rack up the hours and generally get pretty good at what they do. Like putting on an old pair of jeans, flight becomes for many, comfortable and familiar. But some experienced pilots secretly long for something new to inspire them. Or they get bored with their flight and decide to try something new. Occasionally students, and sometimes even instructors, are seen or reported doing something which either makes the antennae pick up or even requires instructor intervention with the reassuring "taking over". Generally however the heart rate and the excitement are pretty well contained - yes we've all become good at keeping the flying manageable while still having fun.

Jill Bailey, RAAus Operations Manager, recently wrote an article on normalisation of deviance (also read the insert of the 2016 National Safety Month). Basically, it's the old story of the 'frog boiling in water' syndrome wrapped up in a James Reason's Swiss cheese sandwich. Normalisation of anything is based on repetition without consequence. This essentially means doing it often and getting away with it. Using a mobile phone or texting while driving is an example of normalisation of deviance. Most of us have done that at some time.

So why are highly experienced pilots, who do everything right, fly by the book, are highly respected and often widely known, involved in accidents which make us scratch our heads. We all know pilots like this and, for many in the industry, it leaves us with nagging doubts. Likewise, how do we explain to our loved ones, who say "well if it can happen to them...?"

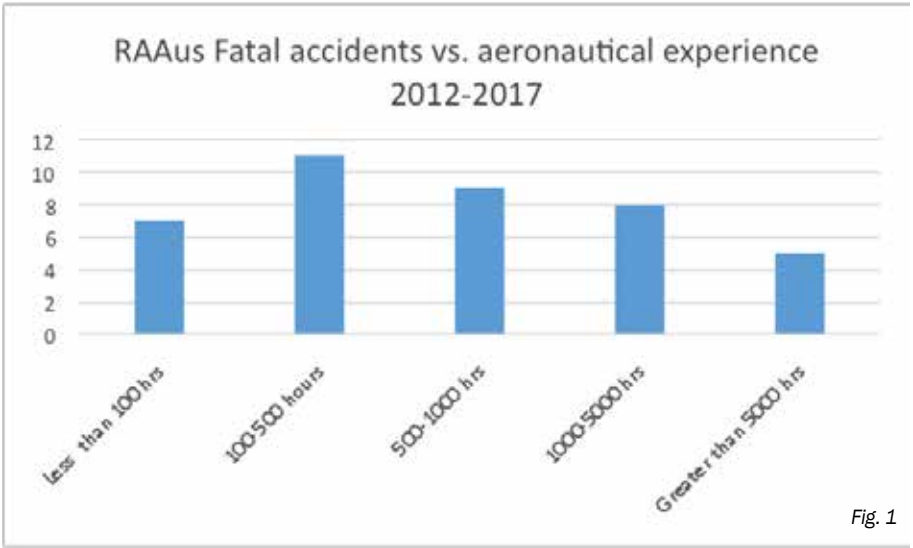


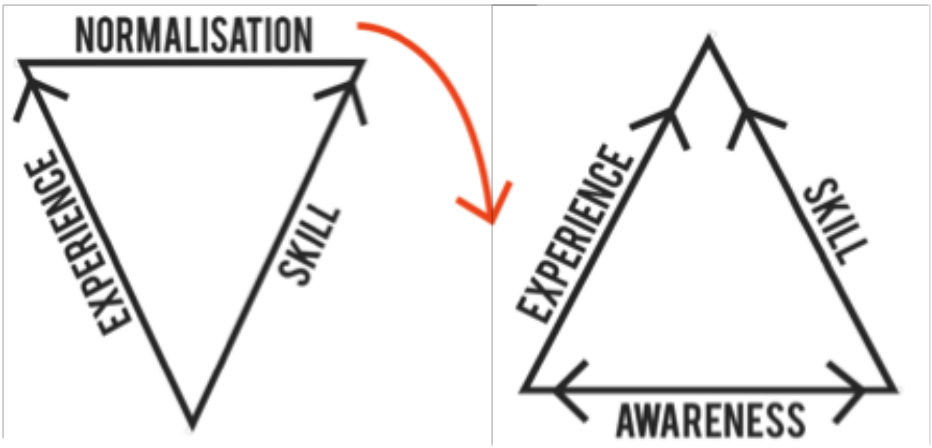
Fig. 1

So the questions must be asked - is being involved in an accident just a numbers game, fate or bad luck? Is it inevitable pilots are involved in accidents just because they fly for a long time? Or are there other factors at play?

Fig. 1 is a breakdown of total aeronautical experience over five years of RAAus fatal accidents. Other than the dominance of the 100 - 500 hour pilot, it's interesting to note that the 5,000 hour pilot is only marginally less likely to be killed than a 100 hour beginner. So, despite the experience and time spent in the air, there is no real marked reduction in exposure risk for the experienced veteran.

I KNOW THEREFORE I AM

It would appear that knowledge and experience, while formidable partners to have on



your side in aviation, are not enough. Think of it like this – if you build a triangle upside down with knowledge or experience, but nothing at the base to stabilise it, it will eventually topple.

A recent article in Flight Safety also looks at the problem of experience and decision making in relation to a tragedy involving a National Airlines Boeing 747-400. As you read through the series of events that led up to that fateful flight, you will shake your head. How could the obvious signs of cargo moving in the hold, 72 tonnes of armoured plated vehicles, not be of major concern to a 6,000 hour captain? Therein lies part of the nature of this complex problem – it can happen to anyone and experience can camouflage the killer in front of us.

Matt Hall, in his book *The Sky is Not the Limit*, talks about tragedies among his very experienced military and civilian colleagues. In his public presentations, he raises the concept of a 'chronic state of unease'. In exploring these human elements, Matt explains that getting too familiar or comfortable with what you do and the way you do it, can lead to unforeseen or tragic consequences.

Another very experienced aviator, who writes and speaks regularly on flying matters, spent many years with his beloved Mooney travelling for work and pleasure. Recently when discussing this very subject explained, "I loved that Mooney. I could make her dance, there wasn't a thing I couldn't do with her. I knew all her behaviours very well, even the ones that could catch you out". He paused for a moment then reflected 'that's why I had to sell it! I was getting too comfortable with it and knew one day it would bite me."

BUILDING TRUSSES NOT JUST TRIANGLES

When designing aircraft, designers engineer for expected loads and then apply appropriate margins of safety. The same applies to pilot experience and decision making. Building a Titanic level of skill and experience is worthy and commendable, but as history shows that experience can also create a very top-heavy triangle without the right level of humility, acceptance of vulnerability and attitude.

So how can we build useful tools to guard against things like the 'thousand hour syndrome?'

In discussing this subject, there is a great anecdote- 'No one has ever died from the flight they just completed". This gets back to the humility of realising it's our next flight which can do the damage. We should approach every flight with the attention and awareness of a first solo, but with the calmness and consideration commensurate to our experience. Only then can we have an effective method to hold off invulnerability and complacency.

How do we avoid becoming the experienced pilot with the problem? In some respects, the very experience itself is actually a large part of the problem. Our experience has allowed us to discover the shortcut, the new way of doing something, accepting a changed procedure or become blasé about completing checklists in an aircraft we have been flying for years.

Using a Personal Minimums checklist is a great method of applying discipline to decision making and guarding against complacency. CASA has a laminated version you can order online and there is an example to download on the RAAus member's portal. You should ask yourself recalibrating questions for both your vulnerability and appetite for risk;

What will I really gain by taking this shortcut?

If I do this abbreviated procedure again is today the day it will catch me out?

Has this shortcut or blasé attitude killed someone before?

Does this just feel too comfortable?

Perhaps expanding on Matt's words, you could apply a chronic state of awareness to build a robust triangle of safety and, in doing so, never get to a point where being above normal ever leaves you below ground on your next flight.

We would like to hear from you about the times your shortcuts, she'll be right mate attitude or get there-itis got you into trouble. Only by openly sharing these experiences can we break the cycle of an experienced pilot getting into trouble or becoming another statistic.

To illustrate the dangers described above, we recommend you read the honest and spine chilling article submitted by Dave King elsewhere in this edition. He is quite experienced, with a long flying career and a wide range of flying in a variety of aircraft and conditions. Despite this experience, or perhaps because of it, he got into serious trouble.

REFERENCES: *https://www.flightsafetyaustralia.com/2017/09/drift-shift-and-crash; http://www.flightsafetyaustralia.com/2017/10/complacency-is-the-hunter; Normalisation of Deviance – 2016 National Safety Month; https://facts.raa.asn.au/human-factors/?tag=Normalisation%20of%20Deviance; Personal Minimums checklist; https://members.raa.asn.au; search/?q=personal+minimums; https://shop.casa.gov.au/collections/checklists/checklists*

Because we can

BY KEN NICHOLAS

WHY do we do this? Flying I mean. Because we want to, because we can, for the love of flying, all of the above, tick as many boxes as you like. There are any number of reasons. I guess, in the case of most pilots, it all boils down to the enjoyment. Some have been enjoying it most of their lives. Others, like me, have made it a lifelong wish finally achieved.

And speaking of lifelong wishes finally achieved, the last time I flew was for my first solo. This really is not very far from first steps, it is still a milestone worth celebrating.

As a recognition of that milestone, my instructor, David, told me he liked students to take the pressure off afterwards and just go for a fly, purely for the enjoyment of it. A lap of the training area was in order.

Actually the pressure wasn't off completely, because I still had to perform to the best of my ability for that stage of my training - get the radio calls right, keep the ball in the middle and don't forget the flap extension speed. Getting all that right just seemed easy this day, because the weather was beautiful and perhaps David didn't lean on me as hard as before. We took off on Lethbridge's sealed runway 28. Climbing out to the north west, I gave my departure call and set a cruise climb for 4,500ft. The day was a little warmer than it had been recently.

The training area is a reasonable size and the upwind departure of runway 28 put us on a heading pretty much direct on the Mount Mercer wind farm. It's a great landmark. In particular, if you're heading home from Ararat or Stawell on a hazy day, you can put yourself over the wind farm and set a reciprocal heading for runway 28 and it'll take you right to runway 10. Handy on those days when the strip is difficult to spot. It's also a good distance marker at 13 miles from home, a good time to think about your inbound call and pre-landing checks.

In that 13 miles to the wind farm, we flew over a patch of tiger country - not very big, but a good spot for a few engine failure exercises David put me through. Not far past that, we approached the Leigh River valley and, for those music lovers among us, we passed directly over the Meredith Music Festival site.

Turning south east just before the wind farm to my new heading of 150 degrees, I headed down along the river valley. It was very enjoyable to take a bit more time and finally have a good look around what I'd been flying over for the past four months or so. I tracked along the heading. Really, I was just following the river valley, because that is pretty much the training area boundary. I descended to 3,500ft, obeying the hemispherical rules, keeping the boss happy. I made a few orbits at various points, looking at the local landmarks from different directions. Because this was meant to be a relaxing flight, there were a couple of times along the way I said, "your aircraft, David" as the photographer in me came out. I grabbed my phone and snapped a few touristy photos for the album. Our next turning point was Shelford, about 14 miles downriver from the wind farm.

This still amazes me. If you didn't know any better, you would swear the area was pretty flat as you approach from around the 3,000ft mark. Shelford, as the name suggests, is a river fording point. The thing is, I do know better and had previously gone out with the GPS to measure the drop into the valley. It's pretty much as I guessed, at a surprising 200ft. The first time I flew down that way with David, he was testing my location awareness. He asked me, "where is Shelford?" Because I live about fifteen minutes down the road I thought, this will be easy. I'll just look for the valley. Not so easy after all.

On this day, though, I was a bit more aware of where I was and where I was going. Turning on the base leg of my training area lap, we were heading east and tracked towards Teasdale and Bannockburn. It never seems to get boring flying over the same places. Each time I go out, I go a little more south or I extend my easterly path for a bit further. Yes, I was very much enjoying my lap of the training area. Still, David was watching me closely for any lapses of good control or procedure.

It's also surprising just how many private strips there are in the region. I had made dummy approaches to some of them during my engine failure training. On one such occasion with the CFI, Graham, we were just to the north of Teasdale when he pulled the power on me and told me, "right, you've just lost your engine. Where are you going to land?" I focused on finding a suitable field not full of rocks, like so much of the local area.

I was down to about 500ft and lined up on a not-so-perfect paddock when Graham said, "why are you landing there? What's wrong with the runway just to your right?" I felt a bit silly. He knew it was there all along. This was a lesson in awareness well pointed out. It was so obvious, why hadn't I seen it? I did have a laugh about it later during the debriefing. Graham had taught me another little trick on that day. I don't know if it's just a peculiarity of the Tecnam Eaglet but trimmed at best glide (68kts) if I maintain that and do a 360 orbit (it apparently doesn't matter what bank angle, it's just the 68kts which is critical), I descend exactly 1,000ft and come out pointing at the paddock I want to land in, just 1,000ft lower.

Getting back on track, I flew over home at Bannockburn and we turned back up the highway for Lethbridge. I had managed to kill a good hour just having a look around, although we didn't actually go very far. It was a good day out, just doing what we wanted and thoroughly enjoying it.

The dream of falling

BY BRIAN BIGG

JUST about every aviation story, by just about everyone who has written for any aviation magazine since the beginning of time (no Pontius the Pilot jokes please) has some version of the following origin story.

The writer remembers falling in love with aviation as a youngster. Either their elders were involved in the activity, they lived near the airport and spent every afternoon there pressed up against the fence or someone they knew gave them a free flight early on.

My own case was different. I had none of these idyllic opportunities. I also had no burning ambition to fly, but I did have nightmares. A recurring one. The same terrifying experience every time. In my dream, I would find myself at the door of a large aircraft and was either pushed or jumped from it. Sometimes the aircraft was on fire. I had no parachute and would fall towards certain doom until I woke sweating and shouting. The dreams started happening when I was about 13.

> "I was four metres from the ground and about to touch down

At a school camp once, I woke in a tangle of blankets on the floor of the dormitory, to be told by worried classmates that I had launched myself without warning from the top bunk. At a friend's place for a sleepover, I ended up pushing in the top of a sliding cupboard door when I leapt from the top bunk, again ending up on the floor bruised and bewildered. No surprise then, I learned from a young age to always choose the bottom bunk. The scariest experience happened when I was a teenager on an overnight train from Sydney to the Riverina. I was dreaming I was about to jump – but I had no chute! I would have sleep-walked out the door of the speeding train if a school friend hadn't been standing there sneaking a smoke in the middle of the night. He grabbed me as I shambled past to certain death.

Obviously an analyst will tell you the dream had an underlying theme of stress or fear, probably of growing up. I didn't have a fear of flying or a fear of heights. The only phobia I have is about snakes – I am irrationally terrified of them. However, at some point I realised the only way to try and put a stop to the falling nightmare was to face it head on (I'm still not going anywhere near snakes).

I announced to my wife that I had signed up to do a parachute jump with the local school. To my surprise she and a rather large male friend of ours agreed to sign up as well. Neither had shown any interest in the subject before, but I welcomed the company.

On the appointed day, we turned up at Wilton and spent the morning jumping and rolling around the lawns with about 10 other fools. The weather, which had been fine all morning, clouded over at lunchtime and threatened rain. The instructor announced we were still good to go and we went to collect our parachutes. Unlike the square shaped chutes of today, which are easy to control and have a wide speed range, the school used surplus army chutes. They were round and descended like wet hankies and were next to impossible to steer. And, according to our sadistic instructor, they had been packed by students at a nearby special school, so maybe they wouldn't open.

And forget about doing a tandem jump strapped to someone experienced, like people do these days. The normal procedure back then was to pack everyone like sardines into a large aircraft, take us to 2,000ft and turf us out one-by-one on static lines. The static line is a piece of cotton attached, at one end, to your chute and the other to the aircraft. When you jumped, the cotton string pulled the chute free of the bag. If the instructor gauged the wind right, you should drift to earth on target. In reality, you had little or no control.

By the time the old twin engined bucket of bolts dragged the crowd of us to 2,000ft, the clouds had thickened, the wind had picked up and there were showers about. The instructor, after a casual glance outside, still reckoned we were right to go. I suspect we must have been due a refund if we didn't jump.

We each checked the rigging of the person in front of us and then we were ordered to shuffle our bums towards the back of the plane where the open door was. The silly bugger who had cleverly hung back as we loaded, now found himself shocked and surprised to be at the very front of the queue to exit the plane. He was not happy with the idea and refused to budge. His bum cheeks must have had octopus suckers on them, because he was immoveable. Fed up trying to negotiate with the poor bloke, the instructor grabbed him and manhandled him roughly until he was positioned at the doorway with his legs dangling outside. Then the instructor yelled into his face, "Go!" We could all see the poor bloke had a death grip on the fuselage. There was no way he was leaving the plane because his hands were welded to the frame. Archaeologists would be able to study him still there in a hundred years' time. "Are you sure it's safe?", he appealed. 'Yes!" shouted the instructor and thrust his shoulder solidly into the bloke's back. I will never forget the look of absolute terror on the poor bloke's face as he involuntarily left the plane and turned to try and claw his way back in. I was next.

Incredibly though, the instructor watched the bloke fall (his chute opened by the way) then declared that, yep there was too much wind after all. The pilot, laughing uproariously, turned the plane around and the rest of us went back down still safe and snug inside.

My wife, friend and I agreed the weather had been God's way of telling us we weren't meant to jump but, during the week, I came to the conclusion that I would never get over my nightmare if I didn't. So the following weekend I found myself at the jump school again.

The dream of falling

BY BRIAN BIGG

My wife and friend had not changed their minds regarding God's intentions.

Because there were only two of us to leap to our dooms this day, the chuckling pilot – he seemed to be a very jolly fellow - took us up in a Cessna rather than the big plane. At 2,000ft I was instructed to hang on to a handle fixed to the back of the wing and place one foot onto the step outside. Then the instructor yelled "Go!'

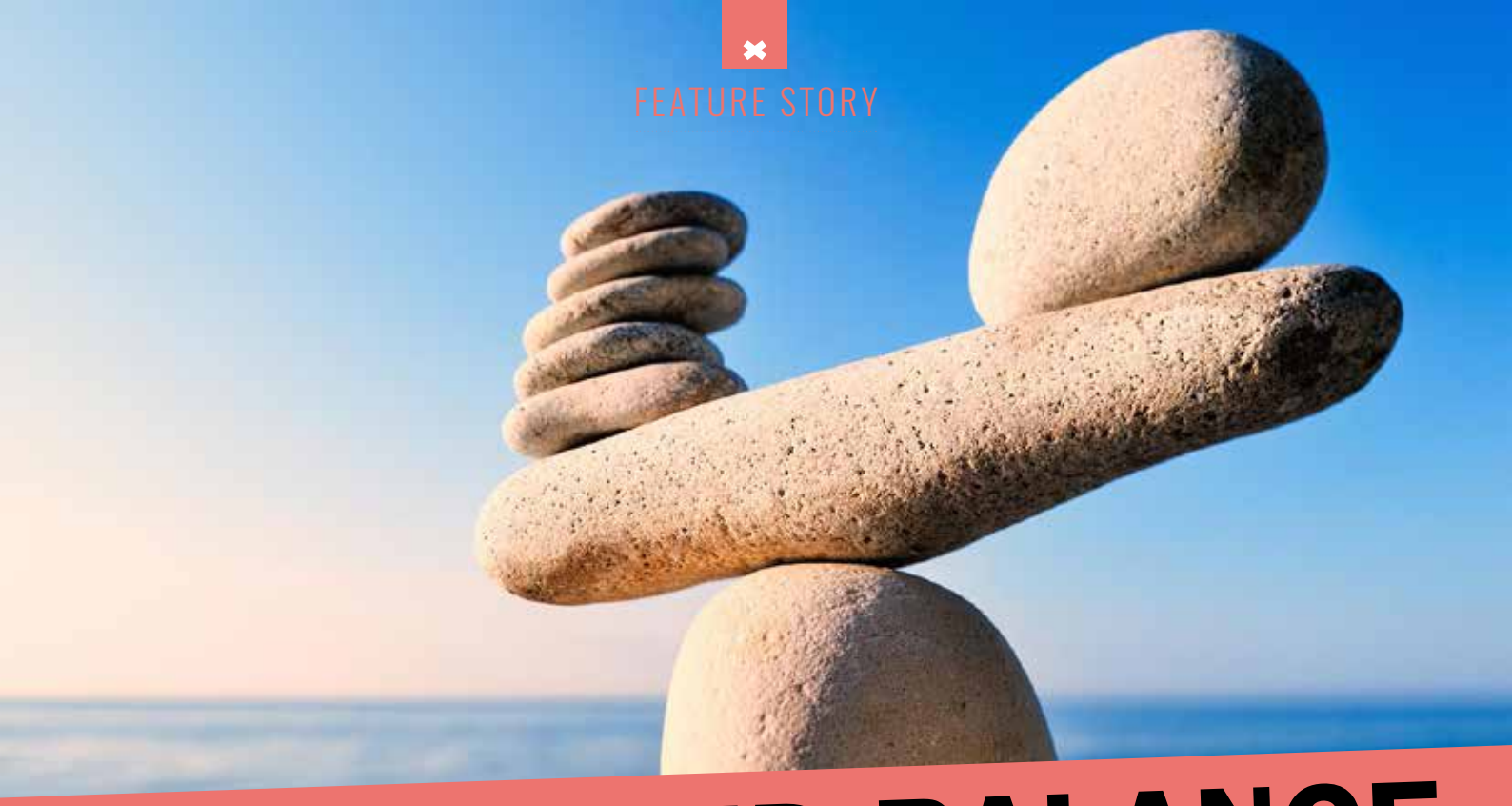
The next thing I knew, I was four metres from the ground and about to touch down. Seriously. I had blacked out at the moment the instructor had yelled 'Go!" In my terror, my mind had obviously said "you don't want to know about this." Thank God (and I obviously just had a direct face-to-face conversation with Her) the static line had worked as advertised. I hit the ground solidly and rolled. I was down. But I was no better off. I had no memory at all of the bit which had been giving me nightmares.

So the following week I went out again, this time accompanied by my wife and large friend who had both now changed their minds about God's plan for them.

The happy pilot treated me like an old friend this time around and loaded us on board. Up to 2,000ft in the Cessna we went and one-by-one we jumped. My wife, bless her, showed no fear at all. She stepped out onto the step, let go and floated gently to the target like she'd done it a thousand times. Our large friend, sweating like a footballer at full time, followed her and then I went. It was easy. I was awake the entire time and, despite nearly hitting a barbed wire fence and a tree and landing heavily on my thigh, I got down sort of in one piece.

Our large friend was nowhere to be found. After a major search, he was located an hour later in a paddock with a broken back. He spent the next six months in hospital wedged between two boards. He blamed me of course.

I never did get the nightmare again. I was free of it. But the entire parachuting thing had not been that exciting. Yes, it was terrifying, but more like a one-off roller coaster thrill than a new adventure. And the fate of our friend discouraged me from thinking of it as a regular hobby. As far as I could see, the only person who'd had any fun on the journey had been the pilot of the jump planes. As we drove home, I thought to myself "I wonder how hard it is to learn to fly a plane?"



WEIGHT AND BALANCE

How to do it? Part 2

BY ROB KNIGHT

LAST time we looked at the catastrophic consequences which await unwary pilots (and their passenger) when flying an aeroplane with the centre of gravity outside the aeroplane's design limits.

We saw how an aeroplane loaded too far aft could have the centre of pressure move ahead of the centre of gravity and cause an uncontrollable and irreversible nose-pitch up. This, I should reassure readers, is not in any way habit-forming; it is very rare for someone to experience this twice in their lifetime.

But what, really, are the Centre of Gravity limits? These are the forward and aft limits at which the centre of gravity must lie for safe flight. They are maximums for the nose-heaviness (forward limit) and tail-heaviness (aft or rear limit) at which the designer believes the aeroplane can safely be flown. Sure, it may fly outside of these limits but the designer says, "You are on your own now, you are now beyond what I think is safe". Seriously - are you really equipped to argue with the aeroplane's designer and tell him that you know more about his design than he does?

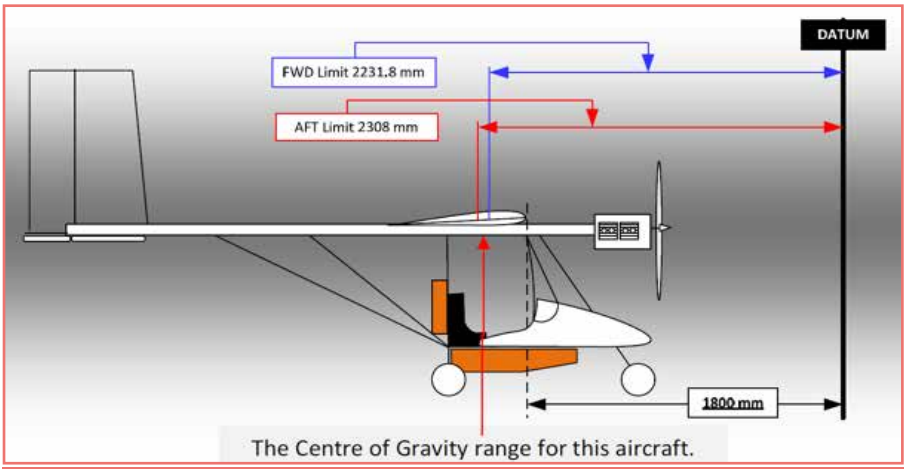
The limits are published in the manufacturer's flight manual for the specific type of aircraft and you will find them in the Limitations section. For GA aeroplanes, these are laid out in the manual in a fashion determined mostly by ICAO (the International Civil Aviation Organisation) based in Montreal (Canada) through the authorities controlling certificates of airworthiness. Thus, they are similar between manufacturers.

However, for ultralights, kit or home-built aeroplanes operating without Certificates of Airworthiness, these standards do not seem to apply.

To visualise the Centre of Gravity limits, let's look at a very simple example. In this case the Flight Manual gives the datum as being 1800mm ahead of the metal surface of the leading edge of the wing. Note the datum is the point from which all measurements are taken and from which points the limits are expressed. The forward limit given is 2231.8mm aft of the datum and the rear (aft) limit is 2308.0mm aft of the datum.

It doesn't matter how big the numbers are, just so long as we can identify them and use them safely. Let's see what this actually looks like.

In Fig.1 the datum and the forward and rear limits are shown pictorially to get a better impression of what we are discussing. Notice that the distance between the limits is just a very small distance along the chord. Compared to the size of the aeroplane, notice just how small the available Centre of Gravity range actually is! Flying at the ends of the range will provide noticeable changes in the aeroplane's handling and performance.



The Centre of Gravity range for this aircraft.

Fig 1

WEIGHT AND B

The image in Fig.2 depicts the aeroplane with its C of G on the forward limit. This position represents the largest arm for the lift/weight couple so it will provide the largest nose-down moment.

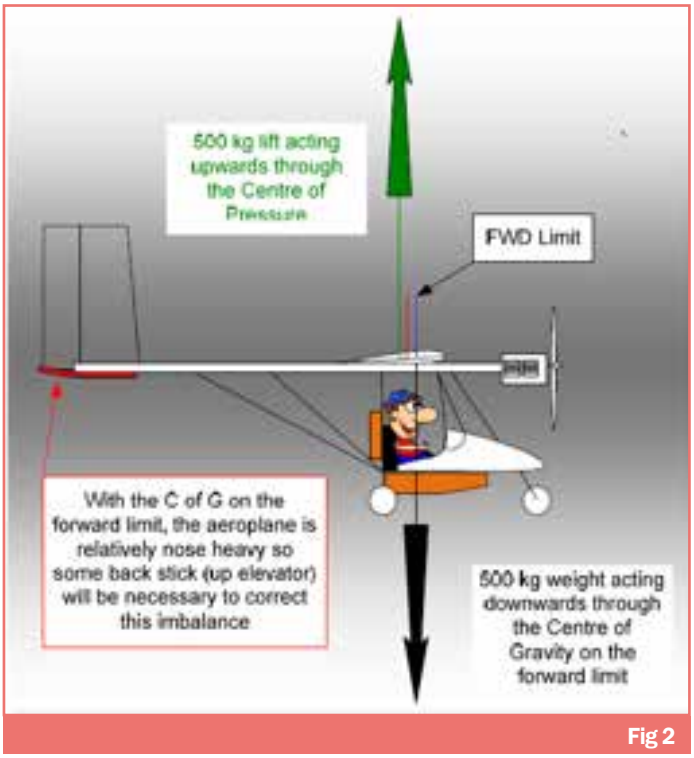


Fig 2

The consequence is a nosedown tendency. This must be countered by back stick/up elevator to generate a download on the tail to hold an appropriate attitude. In normal circumstances this stick load will be removed by the pilot using elevator trim.

The change in flight characteristics will generally be a decrease in pitch up rate and an increase in pitch down. In other words, the aeroplane's nose may be easier to press down than it is to lift up.

This is quite logical – the nose-down moment (lift/weight) has an increased arm between the Centre of Lift and the C of G on the most forward limit.

If the C of G lies further forward than the forward limit, the flying characteristics become dangerous, at both ends of the flight. With the C of G ahead of the forward limit, the take-off may be difficult, if not impossible, to achieve. With a nose-heavy aeroplane there may be insufficient elevator authority to rotate. Too easily, aeroplanes in this situation fail to get airborne and, considering the usual fuel load at take-off, a walk-away crash is almost a miracle.For those who do get airborne, there is always the landing to come. If the nose was hard to raise on take-off, how much harder will it be to raise it in the flare, when the aeroplane is landing, with low airspeed and reduced controllability?

Imagine how it would feel to ease the stick back as the ground arrives and have no response. Try adding full power to overshoot and see the power just drive the nose-low aeroplane into the runway. This is a bit of a show-stopper, but sometimes the pilot and passenger survive.

In contrast is the case where the C of G lies on the aft (most rearward) limit. Now we can describe the aeroplane as being relatively tail heavy. With the C of G no further aft than the aft limit, the aeroplane will be completely controllable and will rotate easily and fly away. After all, it has the designer's guarantee because it is still within the limits.

But what if the Centre of Gravity is behind the aft limit (as in Fig.3)? First, the designer immediately withdraws any assurances which may have been made or implied regarding the aeroplane being safe to fly. St Christopher would agree, adding that the pilot is now on his/her own. The tail-heavy aeroplane will require some down elevator to hold any normal attitudes in flight to compensate for its tail heaviness. In light of this, it is possible that, at any time, insufficient down elevator may be available to lower the nose attitude and/or reduce the angle of attack.

And this is the point where the really bad news appears. Depending on the specific aeroplane design, even a tiny angle of attack increase, perhaps caused by slight turbulence, can send the aeroplane into an uncontrollable nose pitch up. The aeroplane will fall off on one wing, usually the left because of propeller torque, and enter a spin from which no recovery is possible. And all because the pilot has loaded the aeroplane so the normal forces which balance one another, now act in concert and the puny flight controls are totally inadequate to exercise any authority on the aeroplane.

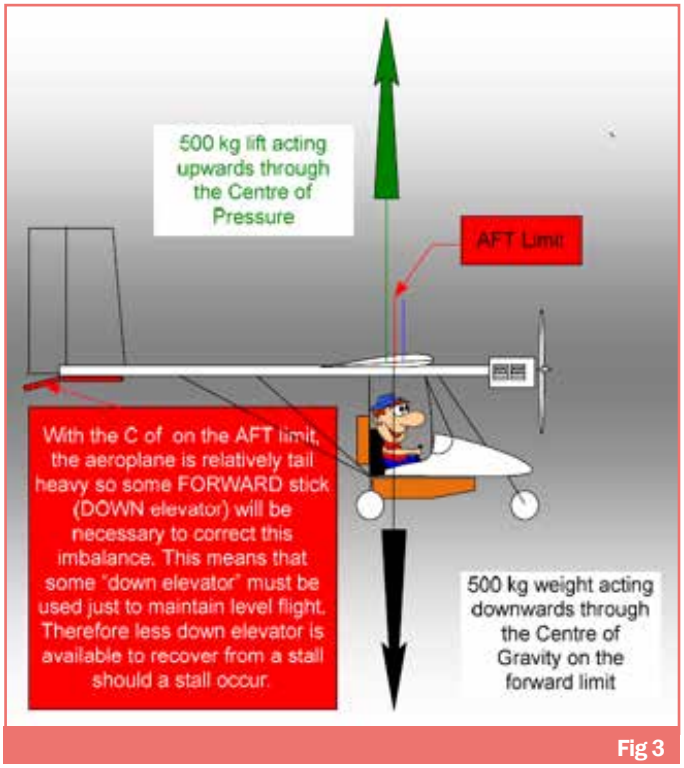


Fig 3

ALANCE Part 2

Frightening? I truly hope so because, all joking aside, this situation truly is non-habit forming. This should provide a basic reason why a thinking pilot would want to know where their C of G is before every flight. Perhaps experience tells them that a normal loading of some fuel, average weighted pilot/passenger, and little baggage in the designated area, will always see the C of G in the design range (between the forward and the aft limits). But when the aeroplane is loaded in an unusual manner, perhaps solo with a tent and camping gear in the baggage area, or doing some maintenance and moving the battery, then knowing the C of G position maybe a necessity for life.

So how can a pilot find the position of the C of G?

In theory, every aeroplane's flight manual is required to provide the details necessary to ascertain the C of G position. While some flight manuals are excellent and this critical information can be determined with ease in just a few minutes, others fail dismally. I personally don't understand how the aeroplane manufacturers with a clear conscience, or the aviation authorities who preach safety with every breath, can allow such shortfalls in the necessary details for flight safety. I would also criticise the flight training given to pilots who qualify with the only the barest and sketchiest idea of what they are expected to do to fulfil their duties as a pilot in regard to ensuring the C of G is within limits.

In the best cases, the flight manual provides a table which the pilot can use as a template. All the pilot has to do is follow a simple, three step process.

1. Enter the weight values into their respective boxes and add them to find the total weight of the aeroplane. Of course, the total weight must not exceed the maximum limit for the aeroplane.

2. Multiply each weight by the supplied arm to calculate the moment for that weight and arm. When finished, add all the moments together.

3. Divide the total moment by the total weight. The result is the arm for the aircraft, i.e., the position of the C of G.

A simple example of one such is Table 1. All the pilot has to do is to find the weights relative to each empty weight box and enter them. The empty aircraft weight, arm and moment are always provided in the table as are the arms for the various other items. Note well that a best-guess for weights is not good enough if your life is on the line- only correct, measured weight should be used.

In this case, let's assume the pilot gets accurate weights for himself and the baggage which are 82kgs for himself and 3.5kgs for baggage. The fuel weight is calculated from the useable fuel in the tank. Note that unusable fuel is considered to be included in the empty weight of the aeroplane so it taken into account in the top line of the table. If the fuel quantity is determined to be 30 litres so, with a relative density of 0.72, this will weigh 21.6kgs. The flight manual for this aeroplane lists the C of G limits as being FWD Limit 2231.8mm aft of the datum:
AFT limit 2308mm aft of the datum.
All is good. As you can see from Table 2. the arm for the loaded aeroplane is 2262.814, and it falls neatly about half way through the C of G range.
How hard was that? Now we know, that, at least insofar as the weight and the C of G position go – the aeroplane is safe to fly.

However, if the sum of the item weights exceeds the maximum allowable weight for the aeroplane – some weight must be removed. If the calculated arm for the loaded aeroplane lies outside the limits, the weight must be redistributed and further calculations done until the arm lies within the limits. If not - don't fly.

Item	Weight (kg)	Arm (mm)	MOMENT
Empty aircraft	162.30	2270.02	368424.60
Pilot		2190.00	
Fuel Main (Max 40 lit)		2347.00	
Baggage (max 5 kg)		3115.00	
TOTALS			

Table 1

Item	Weight (kg)	Arm (mm)	MOMENT
Empty aircraft	162.3	2270.02	368424.60
Pilot	82.0	2190.00	179580.00
Useable Fuel	21.6	2347.00	50695.20
Baggage (max 5 kg)	3.5	3115.00	10902.50
TOTALS	269.4	2262.814	609602.30

The total weight must not exceed the maximum weight for the aeroplane.

Calculation:
609602.30 / 269.4 = 2262.814

Aeroplane Centre of Gravity position in mm aft of the datum.

Table 2

NEXT MONTH **Mastering the Centre of Gravity**

An essential industry

THE BEST BITS ABOUT BUILDING YOUR OWN BY DAVE EDMUNDS

I JUST reviewed the last few of my columns and, apart from being impressed with their limpid clarity, I noticed that CASA appears in a number of them. I also wrote about CASA and the Jabiru engine saga last year. Unfortunately, none of these articles was very positive about CASA.

So, I thought I would look up the internet and find out what CASA was actually supposed to do. Here is its mission statement: "To enhance and promote aviation safety through effective safety regulation and by encouraging industry to deliver high standards of safety."

The mission statement also lays out a set of values and 'behavioural attributes'. It is not nit-picking to mention just this one, 'Achieve results, show initiative and innovation.'

The behavioural attribute which follows this statement is, 'CASA employees find solutions and strive to improve performance. They operate efficiently and effectively and take action to drive improvements. They encourage innovation and adapt to changing environments.'

Only, they don't do this. I know it is a very hard statement, but that does not alter the fact.

There is no point in rehashing the Jabiru saga. The actions of CASA in that instance are reminiscent of Winston Churchill's observation about US foreign policy to the effect that they will always do the right thing after having exhausted all other possibilities.

It is, of course, completely reasonable that CASA would be focussed on airline traffic, but in 2015, 20% of all hours flown were by RAAus and GA recreational pilots.

Early this year, the Department of Infrastructure and Regional Development commissioned a General Aviation Study, which seemed like a good idea, except that the terms of reference have nothing to do with the sorts of issues those of us in the 20% might face.

In my last article I commented on CASA documentation in relation to modifications to recreational aircraft. I suppose if you are employed full time as some sort of compliance officer for Qantas, you might get your head around it, but for the rest of us it is pretty irrelevant. It is extraordinarily complex, with vast numbers of convoluted cross-references. Using this documentation is a specialist vocation, and yet there is a great deal of it which theoretically applies to our aircraft. I am sure CASA would say it is our responsibility to know the rules under which we operate, but most of us live in the real world where we combine knowledge and experience with common sense, which is probably safer than spending too much time parsing legal documents designed to ensure CASA carries no liability. The failure to address the real-world environment is a risk to safety.

CASA has not addressed the introduction of GPS navigation implemented on general devices such as laptops and tablets running GPS programs. These have been around for about seven years and their use is pretty much universal. The failure to incorporate these devices into the general and recreational flight environment is another risk to safety.

When any legislation is written, it is usually pretty much under the control of the organisation it is supposed to regulate. In theory, the minister is supposed to direct this, but in highly technical areas it is unlikely the minister has a clue. There is not much evidence that Ministers of Aviation in this country have ever had any idea of their portfolio. Anyway, aviation policy has been subsumed into a broad transport portfolio. Letters written to the minister are returned with his signature and, so far it has always been a 'he', drafted by someone in his department, with his signature attached. There is rarely any indication of engagement, just a marginally courteous rejection of whatever you might have written in the letter.

CASA argues from time to time that some aviation issue is beyond its remit, but given the way in which its remit is constructed, this argument is often disingenuous.

It is not just CASA and the federal government. The first article I ever wrote for this magazine concerned the absolute refusal of the ACT government to consider a GA airfield, so I don't think CASA's attitude is unusual.

The August edition of the EAA's magazine had two associated articles. The first was about a project in California to equip a number of relatively close regional airfields with rechargers for electric aircraft. There is government grant money involved. These airports are in range of each other and have been selected to allow primary training and navigational exercises. The project is based around the Pipistrel Alpha electro aircraft. This plane is designed as a 'traffic pattern trainer' with a duration of around 90 minutes. An associated move is to petition the FAA to amend the definition of a LSA aircraft from a 'reciprocating single-engine aircraft' to include electric propulsion. The point is made that the costs of operating these aircraft is dramatically lower than petrol-engine aircraft, and will enable more cost-effective training.

The second article is one concerning a looming pilot shortage in the US. Presumably this will impinge on Australia. The author cites a number of reasons why the looming shortage is different this time.

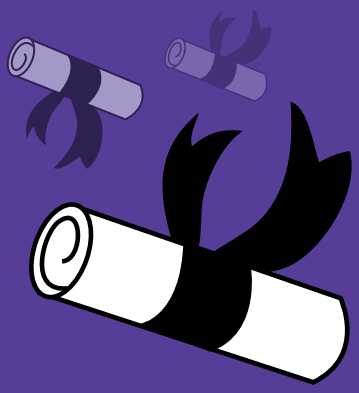
CASA's role does not include industry support. There is actually no other body doing anything about it, particularly in our area of operation which is the foundation of aviation in this country. There is a mish-mash of bodies, state and federal, with some interest but no coordinated responsibility to foster the industry. Our government is addicted to a hands-off view of industry, as applied to our car industry. It's approach was unique, and the consequences quite predictable. It is very hard do see how a regional electric aircraft initiative, like that in the US, could get up here.

The current aviation policy of the government is to facilitate the loading of passengers onto large foreign-manufactured planes, operated by increasingly-foreign crews, maintained overseas and to develop policy related to ASIC cards.

This is just a whinge. I am suffering from withdrawal because my plane is receiving an engine overhaul. I can see no obvious way in which to promote an industry I consider essential to the well-being of our country. I know RAAus has begun to participate in the relevant forums, but its influence is still limited. My hope is that the political ideology surrounding industry, and aviation in particular, changes and leadership emerges. It is terrific the government has announced the establishment of a space agency, because space is apparently considered an essential industry and therefore needs coordinated government support. Wouldn't it be nice if we also had an aviation agency?

As easy as A-N-C

BY PROFESSOR AVIUS **AVIATION GURU**



FROM the earliest days of flight training, pilots are taught an important set of priorities which should follow them through their entire flying career: Aviate, Navigate and Communicate.

The top priority, always, is to aviate.

It means fly the airplane by using the controls and instruments to direct the aircraft's attitude, airspeed and altitude. The instruments directly in front of the pilot provide important information on how well the pilot is doing with basic control. Starting from the top left and moving clockwise, the pilot gets information on airspeed, attitude with relation to the horizon, altitude, vertical speed and rate, magnetic heading and turns and coordination (i.e. is the fuselage aligned with the direction of flight).

Rounding out the priorities are figuring out where you are and where you're going (navigate) and, as appropriate, talking to ATC or someone outside the airplane (communicate). It seems simple to follow, but it's easy to forget when you get busy or distracted.

DISCONNECT FROM DISTRACTIONS

Do everything you can to minimise distractions from every source. If you have passengers, explain to them during the pre-flight briefing about the need for a sterile cockpit. Remind them about it during the take-off safety briefing and again when you conduct the pre-landing briefing. Even if you are alone, it is a good idea to self-brief. Verbally reviewing sterile cockpit procedures can help you establish the focused, no-nonsense mindset you need for critical phases of flight. Consider giving your passengers a job to do such as scanning for traffic or calling out altitudes. Staying ahead of the airplane is another good way to stave off distractions. That way, if something comes up during a flight, you'll have more time to assess its impact on safety and determine an appropriate course of action. It's all a matter of priority.

Part of the pilot's responsibility for pre-flight planning and conduct of the flight is to avoid situations which might require a choice between breaking regulations (e.g., avoiding controlled airspace) and breaching physical limits (e.g., the ground or an obstacle, such as a building). But when such a choice must be made, it's important to evaluate the risk and make the best choice for the safety of the flight.

If you think you might be in an emergency, then you probably are. Use your authority and declare an emergency. It's always better to explain your actions from a safe place on the ground, than to have the safety authority speculating about them in a report you aren't around to read. *

HANGAR (SAFETY) TALKS

Results of the survey conducted after 2016 National Safety Month: After two years, 71% of flying schools have not held a hangar talk for the National Safety Month campaign.

- In 2015 7.5% (nine) schools held a hangar talk as part of the campaign;
- In 2016 27% (33) schools held a hangar talk as part of the campaign.
- 81.36% of flying schools understood the concept of National Safety Month meant hangar talks could be held outside the month of October;
- 61.67% of CFI's indicated they intended to host a hangar talk in the future.

As at early October, only 2.4% (four) schools had planned and committed to hosting a hangar talk in conjunction with this year's Safety Month initiative. To those who have engaged – you and your team are acknowledged and applauded. To the other schools, this is a big disappointment. It seems very few CFIs and the instructor teams have committed to promoting Safety Month (at least officially) and to host a hangar talk to promote safety. It may be considered by many that those who really must attend (and broaden their horizons of safety) are the ones who don't attend. But this shouldn't be an excuse not to host one. Low student pilot numbers are also not an excuse – students operate in a controlled environment (where the risks have been identified and processes put in place to manage those risks). There are many opinions as to what level of experience is at most risk. Statistical trends suggest there are phases and mostly it's about attitude. But unless all the risks are identified and continually managed someone you know will be at risk.

> "It's important to evaluate the risk"

- Daily Inspection
- Fitness to Fly
- Fuel Management
- Low Flying
- Maintenance Logs
- Normalisation of Deviance
- Pre take-off safety brief
- Runway Loss of Control
- Weight and Balance

QUOTABLE QUOTES:

- How we act as aviators today paves the way for our freedoms tomorrow.
- Pilots are not inventing new ways to injure themselves.
- The rules are written in someone else's blood.
- Safety is no accident.

As a CFI, if you are so busy you don't have time to organise a hangar talk, one must ask why you are so busy and what else isn't getting attention? But there is an option. Delegate the hangar talk to a senior instructor with an instructor to assist. Most senior instructors are aspiring CFIs so make it an opportunity rather than a task. With the support and media available from the RAAus office – it's no big deal.

To those flying schools which did not plan an event for Safety Month: From mid-November (when you receive *Sport Pilot*) until the end of June 2018, there are nominally 64 weekend days (your event could also be at night, through the week or a Friday night BBQ at the club, if that works). Lose a few weekends for Christmas /January holidays/Easter and grandma's birthday and there are at least 48 available days to schedule a hangar talk. That's the challenge.

**This is an abridged version of an article (ca 2008) sourced from FAA Aviation Safety: So it's not new and wasn't new then.*

5032 MORGAN CHEETAH

326.2 Airframe Hours, 55 hours Engine Hours, Cheetah. Morgan Cheetah, Camit 2200 engine, 55 hours on the motor, 350 airframe, no accidents, 115 KTS cruise.
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286 Airframe Hours, 626 Engine Hours, RV-3A. RV performance with Lycoming reliability. Lycoming O-320-A2B 150HP,150-160kt TAS cruise @32lph. New prop, instruments & paint. A/C can be registered VH if aerobatics required, and can be delivered anywhere in Australia for cost. $65,000.
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450 Airframe Hours, 114 since Zero timed Engine Hours, J120. Engine 114 since Zero Timed.Many new parts used. Crankshaft magnetic particle checked. Aircraft could go back into commercial work with check. 1/2 share in Steel Hangar near Bega/ Merimbula available cheap
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5086 ROTAX 912A 100HP CRANKCASES FOR SALE

nil Airframe Hours, nil Engine Hours, nil. Rotax 912A 100HP crankcases for sale. Year 2011+ improved crankcases, tt 1335, in good condition. Ideal for replacing earlier model flawed cases.
PRICE $3850
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5507 Airframe Hours, 1436 Engine Hours, Piper Archer. Wanting to get your CASA ,Äì RPL/PPL/CPL Or just fly cheaply from Parafield this is the deal for you: PARAFIELD SYNDICATE SHARE ($5K) ,Äì PIPER ARCHER II. Fly $150 per hour wet and $75 per month fixed. See website: www.parair.webs.com
PRICE $5000
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5095 TOPAZ

300 Airframe Hours, 300 Engine Hours, Topaz. Topaz 24-8438 ttis 300 hours. Rotax 912UL cruise 105 kts at lph. Ballastic parachute. Standard analogue gauges, electric flaps, trim on central joystick. Wide cockpit, centre arm rest, leather seats, 40kg luggage.
PRICE $90000
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5140 PARADISE P-1

286 Airframe Hours, 286 Engine Hours, P-1. PARADISE P-1
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5196 TECNAM P-92S ECHO FOR SALE

920 Airframe Hours, 920 Engine Hours, P-92S echo. Great recreational plane on property at Manilla NSW, Always hangared and in excellent condition. Many extras parts and fittings included in sale price.
PRICE $55000
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5197 SKYFOX CA21

309.2 Airframe Hours, 309.2 Engine Hours, CA21 Skyfox. Skyfox CA21 in excellent condition,T/Hrs 309.2 recovered using Stitts system, new upholstery. All ADs completed incl. alum. laminated aileron hinges GA dash. May be oldest flying Skyfox in existance S/N CA-21010. Easy to fly.
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5202 FLIGHT DESIGN MC. 2010 MODEL. 751 TT. GARMIN 430W GPS

743 Airframe Hours, 743 Engine Hours, MC. FLIGHT DESIGN MC. 2010 MODEL. 743 TT. MAF OWNED SINCE NEW. VH-REGISTERED. (OPTION TO LSA) 100 HP ROTAX. ALL GARMIN. G430W GPS/NAV/COM. 2ND COM. EFIS x 2. MODE S TRANSPONDER. AUDIO / ICOM. ELT. FDR. NIGHT VFR. COMFORT PACK. SIDE BY SIDE SEATS.
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1191 Airframe Hours, nil Engine Hours, Rally. Rotec Rally/Pather, slight damage to one wing strut via transport. A strong built, easy to fly aircraft, cruises at 75 kts, 50Ltr long range tank.
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90hrs Airframe Hours, 90hrs Engine Hours, Acrolite 1B. Single seater bi-plane. 2200 Jabiru solid lifter. Disk brakes, Matco tail-wheel, new tyres and battery. Always hangared, covers. Timber spars. First flown 2013. 85kt cruise, 3hrs endurance. Ailerons upper and lower wings.
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32 Airframe Hours, 32 Engine Hours, M22. Compare this Seamax with any other amphib LSA. 100kt IAS in cruise. 18L/hour 95 octane mogas. Reverse thrust and water rudder for water handling. 279kg useful load. Salt water friendly composite /stainless steel , no alum frame like searey
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5261 LIGHTWING GR912

2523.9 Airframe Hours, 311.7 Engine Hours, GR912. Lightwing GR912 Tailwheel - 1989 factory built and registered. Always hangared, L2 maintained. Suitable as trainer for tail wheel endorsement. Recently overhauled, Reluctant sale, Negotiable at $32,000
PRICE $28000
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5268 JABIRU J250 2004

345 Airframe Hours, 345 Engine Hours, J250. Jabiru J250 2004. Solid Lifter eng. VGs, Elect Flap, Trig Mode S Txp, Area 500 GPS, Microair VHF, Area 500 GPS, All 10 Ply Tyres, Gt Touring A/C.
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5275 QUICKSILVER GT 500

5 Airframe Hours, 5 Engine Hours, GT 500. Quicksilver GT 500. Owner meticulously Built. Fun Plane to Fly Selling to start a new project.
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5297 RV6 VH-MJH FOR SALE

290 Airframe Hours, 290 TIS Engine Hours, RV6. TT AF/ENG/Prop 283 Hrs LYC. O 360 180 HP. Metal FP prop. Nil accident. Best SAAA ‚ÄòAll Metal Aircraft‚Äô in 2006. CRZ 160 KTAS on 30 ltrs. CoA, Day/Night VFR with NO flight over built up area restrictions.
PRICE $100000
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EMAIL RV6MJH@BIGPOND.NET.AU

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nil Airframe Hours, nil Engine Hours, nil, Change in circumstances means #37 Tigermoth Ave Temora Airpark is on the market! Brand-new 15x15x 6m high hangar on a 50 x 25m freehold block, it has unrestricted views across the entire northern side of the airport. Power, water, gas & sewer avail.
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5307 SEAREY KIT - 2012 YEAR

0 Airframe Hours, nil Engine Hours, Searey SEAREY KIT 2012 YEAR $50,000 As life has interrupted my plans I have for sale my SEAREY KIT still in its crate. I believe if you were to order one now you would

pay Approx $15,000 more.
PRICE $50000
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5309 SHARE IN AEROPRAKT A32 VIXXEN AT CABOOLTURE QLD

150 Airframe Hours, 150 Engine Hours, A32 Vixxen. A share is available in The Davewood Syndicate Vixxen based at Caboolture. Long running syndicate dedicated to providing a low hour high (currently 150) standard machine at reasonable rates of $85 per hour wet and $100 per month fixed.
PRICE $10000
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5310 JABIRU J160-C IMMACULATE CONDITION

560 Airframe Hours, 290 hours (18th April 2008) Engine Hours, J160-C. Jabiru J160-C - Immaculate condition. Garmin 296 GPS, Transponder, iPad holder, Illuminated Compass, Electronic T&B indicator (for Auto Pilot), Electronic Carb Heat, Turbo Extractor exhaust, Petroni composite prop, Large battery and external charger
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221 hours Airframe Hours, 221 hours Engine Hours, Zodiac ch601. Zodiac ch601
PRICE $30900
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5321 THRUSTERT300

1420 Airframe Hours, nil Engine Hours, T300. 1988 Thruster T300 25-0238 1420 Hrs 582 grey head, electric and pull start, 74 lt. tank,alloy wheels, fluorescent yellow wings, red tail and pod. Good looking aircraft, great to fly, always hangared and currently hangared at Lethbridge Victoria.
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575.6 Airframe Hours, 575.6 Engine Hours, J230C. Factory built 2007. Excellent condition. All AD,Äôs up-to-date. Glass cockpit: Dynon D100 EFIS, AvMap EKP IV, GPS, Sentient AirNav GPS touch screen. Lots of extras. Hangered at Warwick (Qld). $75,000 or nearest offer. Phone (after-hours) 0438 66 3371.
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5334 JABIRU J200 19-5073

624 Airframe Hours, 240 Engine Hours, J200. Build 2003, Owner purchased 2010, Airframe TTIS 644 Hrs, nil accidents, repainted at Factory 2013, GA analogue instruments, vacuum pump, A/H, D/G, Electric T&B, voltmeter, keyed ignition, Microair radio, dual headsets and 2 x GPS's, 140 lit fuel
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CONTACT JEFF NOTT 0418 843 954

5335 TYRO MK 2

60 Airframe Hours, 30 Engine Hours, Tyro MK 2. Tyro MK 2 fully refurbished 4 years ago with stits polyfibre. VW 1600 twin port aero engine (30 hours) with new Ark tech propeller. Holds 50L of fuel, with a burn of 7-10L/hour in cruise. Call Les 0438 017 256. Located in South East Tasmania.
PRICE $8500
CONTACT LES SKINNER 0438 017 256

5348 JABIRU 120C - 24-5453

1050 Airframe Hours, 180hrs Engine Hours, 120C. 2200 engine, full rebuild 180 hrs ago L.2 maintained, oil and filter changes every 25hrs, A/D and service buletins , Std VFR intruments, Garman GPS wheel spats, always hangared.
PRICE $34990 (NO GST)
CONTACT ARNOLD NIEWAND 0429 857 275 MARK GRIFFEN 0427 887 311

5355 MINICAB J14

168.5 Airframe Hours, 168.5 Engine Hours, J14. Much admired aircraft built to the highest standards by Keith Jarvis in 2002 being his 14th aircraft constructed. Great performance and very easy to fly and maintain. 95 knot cruise @ 2400 rpm. Fuel @ 13 litres per hour. Solid lifter 2200 Jabiru Engine S/N 744. TT only 168 hours. This aircraft is meticulously built, operated and maintained ...
PRICE $32000
CONTACT IAN JARVIS 0419 838 925

5368 ALLEGRO

610 Airframe Hours, 610 Engine Hours, Allegro. 2009 Allegro, rotax 80 hp, 610 hours total time. Usable load 250kg, Endurance 4.5 hours @ 100 knots tas.
PRICE $49000
CONTACT DAVID BUCHANAN 0427 210 083

5369 TECNAM P2008

1430 Airframe Hours, nil Engine Hours, P2008. Dynon Skyview, Garmin SL40 VHF comm, Garmin GTX 327 Transponder, Garmin GPS Map 695, Fuel Scan FS450. Always hangared. Flawless service history
PRICE $109000
CHARLES LIGGETT 0438 043 057

5370 RAMPHOS AMPHIBIOUS MICROLIGHT

118 Airframe Hours, 118 Engine Hours, Trident. A real fun machine landing and taking off on land or water. Low hours 912. Foldable wing for easy storage. LSA rego.
PRICE $30000
CONTACT PAUL MCBAIN 0439 922 323 RALPH 0409 318 230

5371 ALPI PIONEER 200

967.4 Airframe Hours, 967.4 Engine Hours, Pioneer 200. Pioneer 200, Interior 7/10, Exterior and paint 9/10. Excellent economical and very well equiped owner aircraft. Price includes GST.
PRICE $65000
CONTACT MICHAEL JOHN PENDERGAST 0418 521 534

5373 SPACEWALKER SW1

unk Airframe Hours, nil Engine Hours, Spacewalker SWI. Single seat SW1 Spacewalker. Restoration job. All structure complete, condition 6/10. Outer wing panels OK, Centre section requires rebuild. Engine mount for A65. Located Sydney.
PRICE $5000
CONTACT NEALE DUNSTAN 0424 944 697

5378 BREEZY

48 Airframe Hours, 546 Engine Hours, RLU-1 Breezy. RLU-1 BREEZY. Best available. Two seater. Rolls Royce Continental 0-200. TTSN airframe 48hrs. Eng 546hrs since O/H Gentle 'open cockpit' flyer! Built by LAME. Current annual. Absolutely immaculate. Helmets & Icom radio.
PRICE $37500
CONTACT JOHN HITZKE 0428 883 311

5379 RANS S6ES COYOTE

325 Airframe Hours, 325 Engine Hours, S6-ES. Rotax 912 Engin, 325 Hrs engine & airframe, Rego until August 2018, Hydraulic brakes, large wheels, Very easy to fly, Folding wings. Includes trailer.
PRICE $35000
CONTACT ROBERT WILSON 0428 667 586

5382 FOR SALE - SIGMA 4 AIRCRAFT

330 Airframe Hours, nil Engine Hours, 4. Factory Built, 330 Air Frame Hours, 330 engine Hours, Rotex 912s/uls Engine, Garmin Area 500 GPS, 1 X IPad Holder, ICom 200 Radio.
PRICE $58000
CONTACT BARRY HEARD 0417 473 780

5384 SAPPHIRE

535.6 Airframe Hours, 140 Engine Hours, Sapphire. Don't be left on the ground, looking up, wishing you were flying. For a very affordable price you could be flying too! The Sapphire is a classic and well respected Australian built design. Rebuilt with new electric start Rotax 503, new Bolly 3 blade prop, new instruments and electric system. It is ...
PRICE $13000
CONTACT MUSTAFA BOZKURT 0408 516 816

5385 RV12 FOR SALE

245 Airframe Hours, 245 Engine Hours, RV12. RV12. TTIS 245 hours. Factory new Rotax 912 ULS 100HP. Dynon SkyView Glass Panel, electric trim, auto pilot, GPS. Icom radio & separate intercom. Annual & 5 yearly Rotax service completed June 2017. All service bulletins completed. Trailer included
PRICE $82000
CONTACT ALAN PHELAN 0411 253 156

5386 QUICKSILVER GT400

317 Airframe Hours, 99.6 Engine Hours, GT400. Quicksilver GT400, single seat, very good condition, always hangared, pleasure to fly.
PRICE $6800
CONTACT MARK BARTLEMAN 0407 344 466

5387 TECNAM RG FORSALE

1100 Airframe Hours, 700 Engine Hours, P92-2000RG. Tecnam RG For Sale
PRICE $80000
CONTACT MICHAEL RIDDLE 0477 000 343

5388 GARMIN GTX 327 TRANSPONDER WITH DIGITAL ENCODER - 40 HOURS OLD

nil Airframe Hours, nil Engine Hours, nil, NA
PRICE $1750
CONTACT X-AIR AUSTRALIA 0418 168 665

5389 JABIRU J170-C

2200 Airframe Hours, 350 Engine Hours, J170 - C. J170-C-Manufactured 2010, 22B Gen3 Engine with no restrictions. Transponder, Garmin GPS, Jabiru composite propeller. Currently cross hired to Adelaide Soaring Club with opportunity to continue arrangement (STCA)
PRICE $59000 INC GST
CONTACT GLENN SCHWARZ 0425 661 112

5390 EUROPA CLASSIC

244.1 Airframe Hours, 244.1 Engine Hours, Europa Classic. Constructed 1999, Trailer, Conventional tail wheel undercarriage, 4 stage flap, 120Kts @20.lph -Jabiru 3.3 engine, TT 244.1hrs engine and airframe, VHF, Transponder, Lowrance GPS
PRICE $40000
CONTACT DOUGLAS GREGORY 0408 386 175
MARY 0417003281

5392 BALLISTIC PARACHUTE NEW IN BOX - CANCELLED ORDER

NA Airframe Hours, nil Engine Hours, 5/560 Soft B1.
PRICE $2500
CONTACT X-AIR AUSTRALIA 0418 168 665

5393 SKYFOX GAZELLE CA25N

2250 Airframe Hours, 2960 Engine Hours, Gazelle CA25N. Skyfox Gazelle CA25N. A/F hrs - 2250. Eng hrs - 2962. Second owner, all A/Ds complied with. Rotax 912. King KT76 mode C transponder, Icom A220 VHF, AvMap digital A/H, Garmin Aera 500 GPS. Tidy aircraft, always hangared. $32,000 neg.
PRICE $32000
CONTACT VICTOR TAYLOR 0427 113 637

AVIATION CLASSIFIEDS

5394 DYNON TRANSPONDER NIB. TRIG TT 22

nil Airframe Hours, nil Engine Hours, nil. For sale: One NIB (New In Box) Dynon Transponder. Class 1, Mode S, High power version. 250 Watt. Comes with aerial.More information here: Dynon Avionics | Mode-S Transponders with ADS-B Out http://www.dynonavionics.com/mode-s-transponders.php. Non-Dynon users may be able to set this up with the Trig "remote head".
PRICE **$2650**
CONTACT **RHETT MITCHELL 0409 835 192**

5395 LIGHTWING GR582

300 Airframe Hours, 300 Engine Hours, GR 582. Factory-built Hughes Lightwing. Professionally recovered and painted. Rotax 582, panel-mount Icom VHF, long-range tanks. Exceptionally low hours (300 from new) and in excellent condition throughout. Forced sale due to medical condition
PRICE **$24500**
CONTACT **MARTIN HONE 0419 368 696**

5396 AUSFLIGHT DRIFTER

2000 Airframe Hours, nil Engine Hours, Strutt base drifter. Drifter for wrecking or restauration
PRICE **$4000**
CONTACT **TOM HETHERINGTON (07) 4625 2126**

5397 BUCCANEER2 ULTRALIGHT FOR SALE

342 Airframe Hours, 342 Engine Hours, 1996. Updated electric actuators and Tundra wheels and tyres. Brand new icon A210. Needs some work on the tail-wheel for water landings. Condition report included. Registered until September 2018
PRICE **$29000**
CONTACT **IVAN LIZARRALDE 0409 660 716**
EMAIL **BLUEPEACE24@YAHOO.COM.AU**

5398 HANGAR AVAILABLE AT QUIRINDI

nil Airframe Hours, nil Engine Hours, nil. HANGAR AVAILABLE AT QUIRINDI
PRICE **$0**
CONTACT **CRAIG CHARTERS 0429 457 759**

5399 RFD 102 MK 3 AVIATION LIFEJACKETS - YEARS TO RUN IN SERVICE LIFE!

nil Airframe Hours, nil Engine Hours, nil. Two brand new RFD 102 Mk3 aviation life jackets. CASA approved. Manufactured Aug 2014, still in service life with next service due Aug 2024. Suitable for adult/child and ideal for private or commercial operations. Located Perth southern suburbs.
PRICE **$300**
CONTACT **PETER HALL 0400 801 531**

5400 JABIRU J200B 19-5266

170 Airframe Hours, 170 Engine Hours, J200B/ Jabiru J200B in excellent condition. TTIS 170hrs, Total engine time 170hrs. All Basic instruments plus AvMap EKPIV. Micro Air radio. 3300 eng. Quite a fast Aircraft.
PRICE **$55000**
CONTACT **ROBERT MUSGRAVE 0407 502 782**

5401 TECNAM P96 GOLF AIRCRAFT 24-4143

1302.6 Airframe Hours, nil Engine Hours, P96 Golf. Tecnam P96 Golf 100 aircraft. 24 registered. Awesome and reliable aircraft in great condition. Dream to fly. Rotax 912 S. engine
PRICE **$65000**
CONTACT **MICHAEL VAN DER HEIDEN 0412 -39 3334**

5402 FOR SALE

90 Airframe Hours, 110 Engine Hours, T 500. Thruster T-500. Rego# 25-0286. Airframe rebuilt to 90 Hours. Engine.582 Blue head. 110 Hours.Has all the gauges you will ever need.Large bush landing wheels. Molded fiberglass doors. Lots of other extras. See pictures. Rego: 19 AUG 2018. Fly it away.
PRICE **$6000**
CONTACT **MICHAEL SHANKS 0497 973 540**

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WHERE IS CAGIT?

CAGIT STILL IN THE WEST

AGAINST all the odds, the highly sought after Come And Get It Trophy remains firmly lodged in the west of the country.

At the time this magazine went to the printers, John Reymond still retained possession of the trophy at Karakin (10nm east of Lancelin) in southern W.A.

If you, or your crew, are contemplating a high-speed heist of recreational aviation's most coveted prize, it's best to keep up-to-date with its latest location by checking the CAGIT hunter's Facebook page, administered by Dexter Burkill, Peter Zweck and David Carroll - Facebook.com/cagithunters.

For a full list of rules about how you can grab CAGIT for yourself, check out the RAAus website.

ADVERTISERS INDEX

A great birthday

WEST Australian student pilot, Patrick Mudd, joined an exclusive club when he flew his first solo on his 15th birthday.

Patrick was actually 15 years and nine hours old, with a total of 18 hours under his belt, when he became the youngest pilot in Australia.

The big event took place at Bindoon airfield at the Top Fun Flying School.

Top Fun CFI, Jack Donsen, reported that the forecast for the day had been for thunderstorms, but the weather held off long enough for Patrick to be given the go ahead.

According to the local paper, Bindoon airfield was constructed in World War Two as an alternate for the larger Middle Swan Airbase. The famous Black Cat catalina flying boats marked the airfield on their maps as they returned from sorties as far away as Sri Lanka. They would land at Bindoon if there was bad weather or if they had fuel problems on their way home. Today it is the home on the weekends of the Superlight Aircraft Club of WA.

Jack told the paper that before Patrick, the last solo he oversaw was with a 56 year old. "You're never too young or old to fly", he quite correctly pointed out.

For more information, www.topfun.net.au.

SEND IN YOUR STORIES

Got an aviation moment you'd love to share? Your kids or maybe your club get together? Send a photo as a jpeg attachment and a short explanation to editor@sportpilot.net.au

Birthday boy, Patrick Mudd with CFI Jack Donsen

BERT FLOOD IMPORTS

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912 iS Sport

STRONGER. FASTER. HIGHER.

The new Rotax 912 iS Sport aircraft engine is a further improvement of the 912 iS and offers oustanding performance with low fuel consumption. Pilots will appreciate the improved take off performance which results in a better climb rate a shorter take off run and a higher cruise speed.

914 F/UL | 115hp

The turbo charged Rotax 914 series offers more performance at high altitudes while keeping weight at a low level.

912 S/ULS | 100hp

In comparison to the 80 hp version of the Rotax 912 series the 100 hp product line offers more power while keeping the weight.

582 MOD. 99 | 65hp

912 A/F/UL | 80hp

ENGINES YOU CAN RELY ON.

More than 170.000 units of Rotax aircraft engines have been sold in total. Since 1989 BRP-Rotax has manufactured more than 40.000 units of the Rotax 912/914 engines family.

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