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One Deck Wonder – Flying the 100% accurate reproduction of an Eindecker E.111. Photo: TAVAS

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READER STORIES

FLY-INS

EXTRAS

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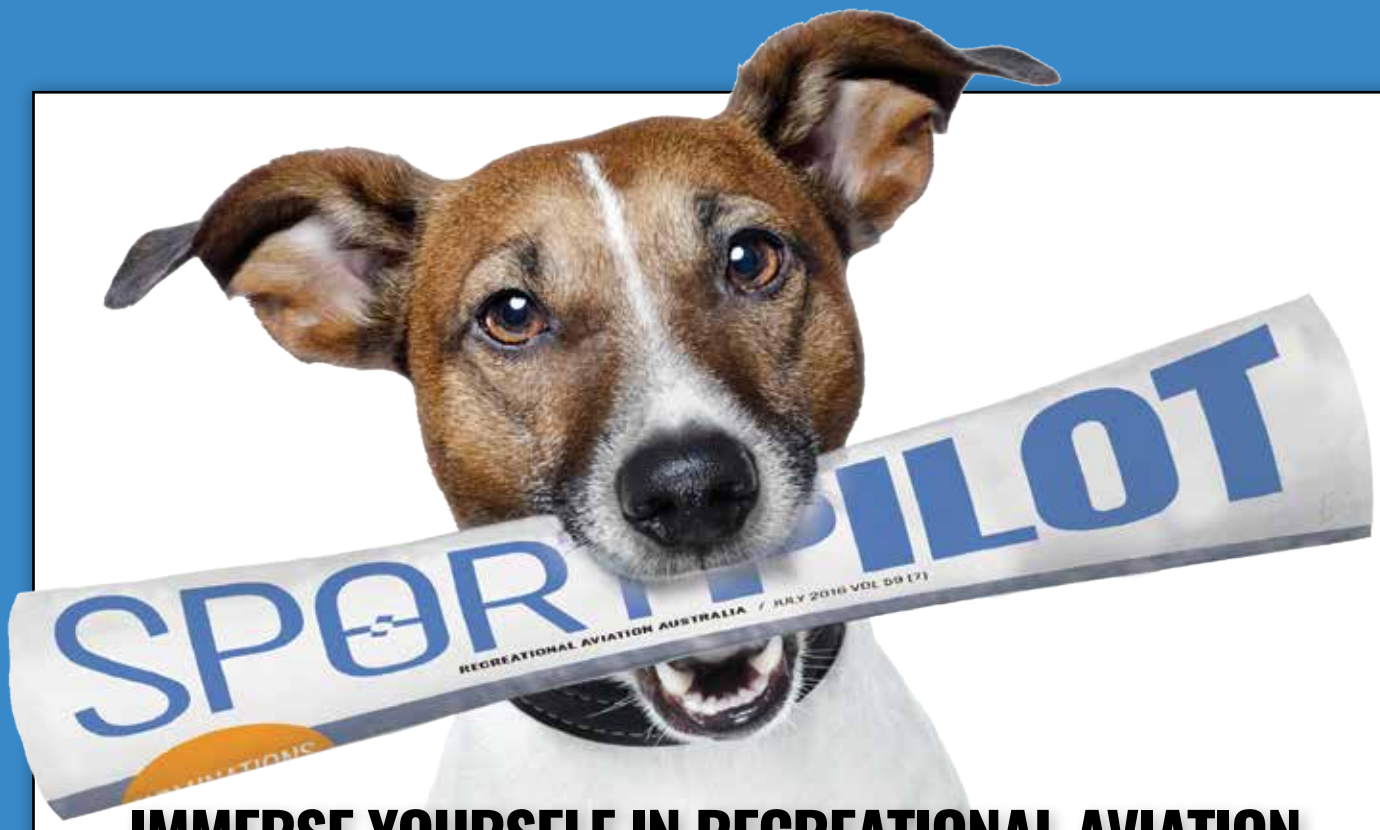

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Staying in touch

BY MICHAEL MONCK

LAST year was a busy year for me. I had a huge amount of work on, which pays the bills, and had a bunch of stuff to do with RAAus. On top of this, I had personal commitments. I give a lot of time to other causes. What this meant was that I couldn't get around to meet as many members in person as I would have liked to have done. Luckily for us, we live in a world where communicating is easy.

Over the past couple of years we have been putting in place new systems to improve the way members can interact with the office. We used to rely entirely on mail and phone systems, which proved to be slow and somewhat cumbersome. In recent times Australia Post has made it worse. It has increased its charges and lowered its service levels, making snail mail much less suitable for time and cost sensitive applications.

Delivery times for mail are now 2 – 6 days depending on the origin and destination. What's more, that time starts from the day after you post an item. In other words, it could be anywhere up to seven days to receive an item by post and perhaps even longer if you live in a regional or remote location.

Add to this the cost of posting. A standard mail item costs $1 to post and, if it is a bulky item like a magazine, the price goes up dramatically due to the heavier weight. We have about 9,000 members and 3,500 aircraft so, before we even buy paper, print a renewal, put it in an envelope and walk it to the post office, we've already spent $12,500. If you, as a member, then do the reverse process when you choose to renew your membership or registration, the cost of renewals goes to at least $25,000 per year. And remember, we're not factoring in the cost of your time, staff time, materials, etc. This is just postage. And that's only for the first notice. Sending a reminder kicks off another round of costs.

Add on other things like posting ASICs, sending out manuals, technical notices or responses to queries and you can see we spend a lot on postage. We want that to change for a number of reasons.

The new systems we have implemented allow members to interact with RAAus more efficiently and quickly. It's a relatively painless way for the organisation to save money.

Logging in to the online system allows you to do a number of things without having to call the office during your work day. Too busy during work? No problem. Go online after dinner to renew your membership, change your address, etc. All at your own leisure. We do, however, recognise that some people don't have efficient internet access, so we are still available on the phone as always. We're just trying to make it more convenient and cost effective.

Communication is not a one way street either. We are constantly trying to improve the procedures. We've changed the way the magazine is delivered and the readership has increased. We send out regular emails to keep people up to date. Our website has been refreshed to offer more valuable content. It's all about trying to stay in touch, even when we can't meet you in person.

By way of example, I wrote in December *Sport Pilot* about an idea I had to help secure the future of RAAus and aviation in Australia. My article talked about everyone contributing to a fund which would allow us to purchase strategic parcels of land to be used by members for aviation. I spoke about the experiences of many aviators frustrated they were being shut out of airports, subject to rising costs or being shunned in favour of commercial interests.

The idea was a simple one which would cost us, as individuals, a small amount of money but collectively offer us a huge amount of value over time. I put out a suggested cost of $75 per year each and others have suggested it should be closer to $200. It was put to me that, even at the higher end, it would still be less expensive than some other sport aviation body memberships. Either way, you can see the potential.

Your reaction to my idea has flowed back to me in waves from all over the country, even though I wasn't able to talk to many members in person over the Christmas New Year period. Most of the communication was positive and came via email. We do not suffer a tyranny of distance anymore. The world has shrunk. By the way, the idea is gathering steam so please keep letting me know your opinion about it.

All of this speaks volumes to me. It tells me, in no uncertain terms, that we can very easily communicate with each other using modern technology and remove the reliance on the costly and time consuming communication methods of years gone by. These will always be available to us, of course, but if we want to remain relevant and survive for years to come, we need to open ourselves up to new ideas.

It's good to see it already happening and not just by the staff in the office. Many members already take the initiative to write us an email. It's allowing us to get speedy feedback and adjust our course where necessary. It's working very well.

None of this makes me less busy, but it does help me to understand how everyone is feeling and reacting to the things we are doing. So keep calling and keep emailing. We haven't got all the answers, but with your help, we can get a few more.

DIGITAL DIRECTIONS

There are many ways to interact with RAAus these days.

Website: www.raa.asn.au
Member portal: www.members.raa.asn.au/login
Lodge an occurrence: www.oms.raa.asn.au/lodge
Back issues of Sport Pilot: www.raa.asn.au/sport-pilot-magazine
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A. 25-26 FEBRUARY
CIRCUM-TASMANIA CHALLENGE

The two day coastal course starts and finishes at Wynyard with an overnight stay at Adventure Bay on amazing Bruny Island. The route covers 685nm of the Tasmanian coastline. Competing aircraft will overfly numerous features with flight paths recorded by supplied GPS trackers. Before departure, competitors will estimate their flight time for each leg and score penalties for arriving early or late. Missing waypoints or undertaking time wasting orbits will also be penalised. A handsome trophy awaits the winning aircraft. For more information, www.wynyardaeroclub.com.au.

B. 3-5 MARCH
AUSTRALIAN INTERNATIONAL AIR SHOW

Avalon airport gets noisy again as heavy metal from all over the world comes to Victoria to roar over your head and send you deaf. If you haven't been to Avalon, you should. All shapes and sizes of flying machines on display and in the air. Get up close to the latest RAAF muscle. Lots of RAAus pilots and their machines fly in. RAAus will also be there in force to promote recreational aviation.
For more information, www.airshow.com.au.
RAAus members get in free! See this edition for details.

C. 12 MARCH
CLIFTON FLY IN

The Lone Eagle Flying School annual fly-in will include International Women in Aviation Week. The fly-in 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 for BBQ, drinks and hangar talk. Fly or drive in, see ERSA. On field camping, bring your swag. For more information, loneeagleflyingschool.org.au, admin@loneeagleflyingschool.org.au or Trevor Bange 0429 378 370.

E. 8 APRIL
LOXTON AERO CLUB FLY IN

The focus this year is 'Partners of Pilots'. Highlights include hangar dinner, raffles, awards for best presented plane and the pilot who has flown the furthest to attend. Presentations Saturday by Howard Hendrick (WW2 bomber pilot – now 93 years old and still flying). For more information, loxtonaero.com.

D. 2 APRIL
BAROSSA AIRSHOW

See vintage, old and new aircraft. Three of Australia's top aerobatic champions will perform. Helicopter rides all day. Food, wine, art and craft stalls, sideshows and interesting exhibits. Rowland Flat airfield is privately owned, half-way between Tanunda and Rowland Flat, right next to the famous Jacob's Creek (34 33'S 138 57'E). Runway 08/26 is 600m at an elevation of 800ft. When operating on Rwy 26 use right hand circuits. Under certain conditions wind shear can be experienced on short final to Rwy 08. For more information, barossaairshow.com.au.

F. 8 APRIL
VALLEY VIEW AIR DISPLAY

Valley View Farm, Northern Gully (23kms east of Geraldton Airport). Joy flights, military equipment, skydivers, model aircraft, Light Horse display, 11th Battalion AIF - Leane's Trench Tours, produce, food and drink stalls, bouncy castle and face painting, free camping. For more details, www.valleyviewvintage.com.au or our Facebook page.

G. 15-16 APRIL
BACK TO HOLBROOK FLY IN

Holbrook Ultralight Club invites ultralight and recreational aircraft owners and pilots to Holbrook airfield for its annual fly-in at Easter. Forums Saturday afternoon which will include an RAAus member's forum. Fly-in dinner Saturday night, BBQ breakfast and a local fly-out Sunday morning. Underwing camping and transport to and from the township for accommodation and fuel available. For more information, John Harley 0456 357 735 or visit www.holbrookultralightclub.asn.au.

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LETTERS TO THE EDITOR

Young gun, Jack, has been flying since he was seven

YOUNG GUN

I'm 13 years old and live near Cessnock, NSW. I have 16.1 hours in my logbook at the moment in aircraft ranging from Rans to Cessna 182s.

The first time I went in a light aircraft, I was seven years old. I went up for a short flight with one of my uncles, John. We took off from Holbrook on runway 22. The feeling of being airborne in a light aircraft for the first time is a feeling I will never forget. I love flying and aviation. Every time a plane flies over my house, I run out to look at it. I plan to apply for an RAAus scholarship soon, so if anyone from RAAus is reading, I'm very, very keen :)

Thanks to all the people who have helped me over the years - to name a few John Ferguson, Graeme Planck, Graham Hawk, Bob Finch, Garry Fraser, James Ham, Keith Alvis and my Parents.

JACK FERGUSON

YES TO AIRFIELDS

RAAus owned airports, 10/10, brilliant idea (Chairman's Report, *Sport Pilot* January 2017). I'm in. When can I pay? There will be some members who don't want to be part of this and will grizzle. For them I propose an 'associate' ownership where they pay half of the contribution and then pay landing fees, while the rest of us pay $100 or $200 a year and then have no landing fees. Hopefully that will appease the naysayers.

I am 100% behind your brilliant idea, Chairman Michael. I don't give a rat's arse how much the contribution is. At $200 a year it's only 10 or 15 landings to get my money back... a bargain.

I say push it and push it hard.

NAME WITHHELD BY REQUEST

PRESIDENT'S REPORT

A pretty good deal

BY MICHAEL BISHOP

DIGITAL DIRECTIONS There are many ways to interact with RAAus these days.

A CHUTE IDEA

It's good to see your Editor's Choice article back again after a break in the October issue. It seems the Devil's Advocate is still missing from our ranks though.

I wanted to share an idea with my fellow readers. The Australian Parachute Federation's magazine each issue features roughly three pages of a selection of incident summaries and the resulting action taken. I'm an active member of the APF and I value learning from others' incidents. I wish RAAus could provide the same information in *Sport Pilot*.

BARTON EDWARDS

***FROM THE EDITOR** / A few things were held over in October to make room for as much information as possible for National Safety Month.*

***FROM OPS** / Information about accidents and incidents are updated regularly on the website. Check these out at https://www.raa.asn.au/safety/accident-and-defect-summaries/. Sport Pilot may from time to time reproduce interesting summaries in the magazine.*

A DEAD HERO

I do admire the Editor's confession at being a coward (Editor's Choice *Sport Pilot* November 2016).

I had a case as a professional pilot where I was asked to do a medivac and chickened out — which no doubt saved my life. So, as in Brian's, and hopefully all of the pilot communities' cases, to fly or not can come down to sensible and personal risk assessment and Airmanship, whether flying for fun or otherwise, in powered or unpowered aircraft.

The circumstances of my flight took place on a dark night, at Kota Kinabalu, Sabah in Malaysia.

I received a pager call well after midnight from the oil company's radio operator, requesting a medivac flight to their offshore oil rig. I was the duty pilot and both the Bell 'Huey' turbine chopper and I were licenced to fly night VFR ops. I regularly practiced flying solely on the gauges, because it was usually necessary when heading offshore on an overcast night with no horizon or terrestrial lights.

'Have you looked outside,' I asked the radio man after silencing the pager and driving to the nearest public phone? 'No, why?' 'The sky is full of sparks illuminating large thunderstorms offshore on the route to the rig. Also, this afternoon, I dodged numerous waterspouts while flying back from there. You can't see them in the dark and the chopper is not designed to swim. Quite apart from the huge thunderstorms which have torn aircraft apart.' 'So you are saying you won't go?' 'That's correct.'

OK, I'll call you when we need you.' Some people have no idea, I thought while heading back to bed. He hadn't even known what the medical problem was and I was not going to risk my life and others to be a hero.

Murphy showed his hand when I took off next morning on the scheduled 0800 flight. I lifted off into clear morning weather and made my departure call at 200ft from KK's international airport. About 20 seconds after take-off, having just crossed the coast, I saw the Artificial Horizon Indicator begin a slow lean as I flew wings level. There was no red flag to indicate a failure but it continued to slowly roll over and eventually toppled.

Had I tried to be a hero the previous night, just after leaving the brightly lit airport and city behind me and facing the IFR blackness offshore, the AH would probably have had me into the sea within a few seconds. It's easy to say I could have checked the other (co-pilot's AH) but we know what rapidly turning one's head when close to the ground or water can do, don't we?

I wonder what the odds were for an unheralded AH failure occurring just when asked to do the only night flight we ever did in 12 months – apart from training during good weather?

The lesson here – be prepared to say NO, rather than be a dead hero. Murphy is always waiting, especially when doing something new or not routine and practiced.

By the way, the medivac patient I brought back that morning just a bandaged little finger!

PHIL LATZ

Skycatchers heading to the scrap. The company saved what parts it could

WHAT A WASTE

Cessna just scrapped the unsold Skycatcher inventory- engines and all - to the shredder. Photos posted by John Hall at the Friends of IF1 page. What a waste.

MARTIN HONE

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).

MORE WAYS TO BE RAAUS

RAAUS introduced two new membership experiences in January.

According to CEO, Michael Linke, "We are excited about the opportunities these experiences can bring for our members, both new and long term."

LOYALTY MEMBERSHIP

"We've introduced a new long term membership option for those members who want to remain loyal to RAAus and who simply want to join and get on with flying. Members can now join or renew for five years and pay the fee of $899, representing a $176 saving on annual fees. Annual and Biennial requirements still apply such as BFR, medical and hours flown. Dates can be checked in your member portal and RAAus will remind you through email and SMS, but remember, it is your responsibility as a member to be aware of renewal dates.

It important for members to regularly visit their member portal page to ensure their information remains up to date and to ensure they remain informed about the business of RAAus.

Loyalty membership is a great way to support RAAus and save money at the same time.

So next time you renew, check for the five year membership in the drop down list.

Loyalty members will also, from time to time, be given special and priority access to emerging RAAus news, events and competitions.

Loyalty members also receive a permanent 10% discount in the RAAus online shop and a free month in RAAus' Aviation Classifieds when selling an aircraft."

TRIAL FREE MEMBERSHIP

"To assist flying schools and to allow people thinking of getting into flying, we've revised the 28 day temporary membership option by introducing a free online trial membership. This membership gives new student pilots a free taste of RAAus for 30 days. They get to experience all of the benefits of the website, the member's portal, the knowledge base and electronic access to *Sport Pilot*. Plus they can start learning to fly with their local school and experience up to three hours of flight without having to pay anything for membership. Once they have decided RAAus is for them, they can then join as a full member and pay the required fee. RAAus will remind them at the conclusion of their 30 day trial, which will allow for uninterrupted flying and training.

The trial membership category will negate the need for flying schools to complete the temporary membership form. Any person wishing to undertake flight training or a TIF can simply join RAAus for free for a month to ensure full coverage. Schools and CFIs are encouraged to distribute the free membership card, which has been sent to all schools. CFIs and schools can also get members to join online for free when they turn up at their school.

If you know someone who hangs round the airfield or someone you have taken flying, encourage them to take up a free trial membership offer and experience what we already know, how much fun flying can be with RAAus.

FREE ENTRY TO AVALON

RAAUS members have been invited to register for free entry as trade visitors for the Avalon Airshow trade days on February 28, March 1 and 2.

The trade day sessions are usually exclusive to industry, government and defence professionals and are not open to the general public.

To take advantage of this offer, you will have to register your interest with RAAus before February 12. RAAus will forward your details to the organisers and you will be emailed an e-ticket for the event.

Please note, only financial and pre-registered RAAus members are eligible and additional tickets cannot be purchased at the gate.

To find out more and to register your interest, www.vision6.com.au/ch/48209/3332h/2285879/abc7czrbk.html.

THE GREAT YEAR AHEAD

BY MICHAEL LINKE **CEO**

2017 is already shaping up as another important year for RAAus.

I hope over the holiday period everyone got a chance to go flying, spend time with family and loved ones, play with some cool gifts and recharge for the year ahead.

One of our major focuses this year will be improving our engagement with members.

The data is telling us that already about a quarter of the membership has now subscribed to the printed edition of *Sport Pilot*, so one in four of you is reading this article on paper.

Half of you read *Sport Pilot* online, with some choosing to use ISSUU (issuu.com/sportpilot) and others downloading the magazine from the RAAus website. Some read it directly on Facebook and others read copies they find at their local club or airfield.

We recently re-introduced *Sport Pilot* to newsagents for a trial period and that appears to have gone well. We are now reviewing the results of the trial and will let you know the outcome. We remain positive about the support of *Sport Pilot* within newsagents.

We also recently adjusted the cost to subscribe to *Sport Pilot* and are pleased to advise more and more members are subscribing every week. Help keep RAAus the thriving organisation it is and subscribe to *Sport Pilot* today.

We also communicate with member using email. We email regular updates, as well as reminders about membership renewals and aircraft registration. We introduced the new registration platform a little over 12 months ago and have found many members have still yet to take advantage of the new system. This has meant some members have inadvertently allowed their membership to lapse. Sadly it means for those members their insurance coverage for third party property damage also lapsed. It is critical you renew on time to avoid losing your insurance cover. To assist with membership renewals, we now use a combination of digital and traditional communication methods to help ensure you renew on time.

I urge everyone to log onto their portal and ensure their details are correct, or at least contact the office to ensure we have everything we need to deliver first class quality membership services to you.

I'd also encourage you to communicate with us directly. As CEO, I give you a commitment we will respond and address your concerns. *Sport Pilot* is your magazine so feel free to write a letter to the Editor, email the office, call us in the office or ask a question on our Facebook page. Just a reminder, though, we don't respond or engage with comments made on aviation based forums.

So let's discuss RAAus and what we want our organisation to be. Without your feedback we are limited in the programs we develop, the messages we send and information we share. Without your feedback we operate in the dark. Tell us what you like about RAAus, what you don't like and how we can fix it. What irks you with aviation in Australia today? How can RAAus better represent your concerns to CASA, the government and the community in which we operate? Tell us a story about your last flight, your new plane, your learning experience or the last get together at your airport or club.

There is so much to talk about and a two way conversation is much better than a one sided one.

Other things in 2017 to look forward to include engaging with CASA as we explore our submissions on Control Zone access and increasing the allowable aircraft weight. RAAus will also again be a major partner with the SAAA and APF for the major fly-in/airshow in October 19 - 21 at Narromine. We are also brimming with ideas for our new training programs for members and, as such, will progressively roll out more training videos and training courses as we did last year. If you missed any of our videos and training courses, visit our YouTube channel: https://www.youtube.com/channel/UC-9uoVIUeTwNC6FiD4_QIzQA

We've included training videos on runway loss of control, weight and balance, how to use our RAAus member portal and much more. You can also relive major events such as our CFI conference, AGM and general meetings.

There is so much to look forward to. It's going to be a great year.

IS THE DIGITAL STRATEGY WORKING?

BY MICHAEL LINKE **CEO**

IN October 2015 RAAus made a fundamental shift in how it communicates and engages with members.

We launched the member's portal, a new website and occurrence management system (OMS). In the background the office also launched a new customer relationship and aircraft management system.

Sport Pilot magazine went online. Every edition has now been digitised so you can go back and read them online any time you want. The original hard copy of the magazine is also proving more and more popular with subscribers.

In July 2016 RAAus launched a learning management system. In October 2016 the knowledge base followed and last month we re-launched the Member's Market classifieds advertising service.

That's a lot of bytes!

As CEO it's vitally important to me to gauge whether or not these services are giving you what you want. One way to determine that is to look at the raw data, the analytics. Another way is to pay attention to the feedback you give us. Combining the two allows me to make recommendations to the board, plus make day to day management decisions to ensure you get the best bang for your buck.

I'd also encourage members to write to me, or send a letter to the Editor and tell us more about what you think of our move to a more digitised landscape. Is it working for you? What else would you like access to?

NEW WEBSITE

Our new site was an instant hit. Our old site was cluttered, carried a lot of outdated information, was cumbersome and suffered because of its outdated technology. The new site removed the outdated material and presented a more streamlined access point for the public.

We also vastly improved the member's only section of the website and combined it with our member's portal.

During 2016 our public website had 78,748 visitors, resulting in 413,338 page views.

The member's only side of the site was visited 17,009 times and those visitors viewed 203,258 pages.

The message from the figures appears to be that we need a better way to engage with the 61,000 non-member visitors to get them more involved with our organisation.

SPORT PILOT

We launched Sport Pilot digital in July 2015. We also introduced a subscription model. At the end of December 2016, 1,800 members were actively subscribed to the hard copy of *Sport Pilot*. Many renewals were due in December/January, so this number will grow over the next month as people renew.

The decision to offer a subscription model was polarising. Some members felt the magazine should be free for everyone, but our financial situation just wouldn't allow that as we tried to rein in costs. Some people loved the idea and subscribed, and continue to do so. More and more members are realising we made the right decision for RAAus and that a paid subscription is the best model.

As digital technologies improve, reading magazines online is becoming increasingly easier. At 51, I'm about the average age of an RAAus member, and I do all of my reading digitally. The more I talk to our members, the more I hear digital reading is becoming more pervasive and people are getting used to it. Most of our members now use an iPad in the cockpit. Why not also use one on the ground?

I'm sure there will also remain a pool of members who want a free printed copy. To assist these members, we provide free printed copies to schools and clubs. And maybe one day we will return to the free model; I'm not opposed to offering a free printed magazine to every member, as long as RAAus can sustain the cost and continue to be viable and thrive. To do that we need more members, more member engagement and reduced costs. Everyone can play a role.

The *Sport Pilot* numbers also tell a story. During 2016 the digital version was accessed over 50,000 times in some way or another. We offer *Sport Pilot* in a number of digital formats and each format enjoys differing success. On the ISSUU platform alone, each recent edition of *Sport Pilot* is read roughly once every 25 impressions and over the past 12 months, the magazine has been exposed to almost 40,000 people per edition. This is great news for advertisers. *Sport Pilot* enjoys a vast audience and represents great value for advertisers.

In the last quarter of 2016 we also returned *Sport Pilot* to the newsagents. The results were encouraging and we are looking to continue it.

MEMBER'S PORTAL

More and more members are realising that doing business with RAAus is now fast, efficient and available at any time. From renewing your membership and updating your details, to checking the due dates of requirements and aircraft registration details. You can even add your flying hours.

Your record is your record and it is there, online, for you to see at any time.

Did you know that since we moved to a digital platform, we have reduced our staff in the administration office by four? Formally we used a pallet of paper per month and mailed out hundreds and hundreds of letters every day. Now we are lucky to visit the post office twice a week.

The member's portal is enjoying a lot of success, but we can do more, and more members can access it more often. At the moment, it receives around 10,000 page views every month. This is great news. Lots of members have taken up the option to log in and check out their digital record.

However some members have never logged in. If this is you, you are missing out on a simple and seamless experience. I urge you to give it a go. If you need help, call the office.

OCCURRENCE MANAGEMENT SYSTEM (OMS)

The OMS has provided members with a simple way to report incidents. Coupled with our open and fair reporting policy, the OMS is giving us fantastic insights into the areas we have problems. It is also allowing us to design training courses to meet these problems head on.

During 2016 we had 310 members report an occurrence through the OMS. That was 25% more than in 2015. The ATSB recently released a report stating that flying was safer today than 10 years ago, and our data is also reflecting that. It is also showing recreational flying is safer than general aviation!

Since the OMS was launched we have seen a dramatic reduction in the number of serious and fatal accidents. We now receive data in a timely fashion and are able to operate in a predictive manner and educate our community about the big issues causing the major problems. Reporting an occurrence can quite literally save lives. I would urge everyone to use the system whenever possible.

CFI PORTAL

We've created a dedicated space online for CFIs to have access to resources and tools. Over time we will add functionality to this tool, including the development of our safety toolbox.

We want to hear from CFIs how we can best use this tool and what they want to see available.

In 2016, 148 CFIs logged into the portal. We need to work harder to improve this resource, so more CFIs get access in 2017. We

	2015	2016
Facebook likes	8,430	10,840
Online resources available	(2) Portal Website	(8) Portal Website CFI Portal OMS Knowledge Base Learning Management System Classifieds Sport Pilot
Average processing time for renewals and new membership applications	5-10 working days	Instant through the member portal and website.
OMS reports lodged	254	310
OMS reports lodged (not including complaints)	198	259
Sport Pilot magazine reach	Approximately 10,000 per issue	Over 40,000 people per issue
Number of online training opportunities available to members	1	2
Number of YouTube videos available to members	12	30
E-Newsletters sent	38	54

also need our CFIs and, for that matter, all instructors to take the leap and modernise alongside us. We see the majority of paper based membership application forms coming from schools. Why not have new members join directly online? It saves you money (postage/printing) and saves RAAus money (staff time re-keying data and collecting mail). If we want our schools and RAAus to remain stable and viable we all need to find ways to reduce costs.

KNOWLEDGE BASE

In October 2016 we launched our knowledge base. For many years RAAus suffered from multiple truths. This means a number of resources, or groups of people, shared different views about similar topics or issues. What the knowledge base did was create a single point of truth. We want factual, science and evidence based information in the hands of our members. Not hearsay or folk lore.

Since its launch we have had 1,478 members visit the site, resulting in 7,500 page views. The most popular topics have been

- Refuelling from jerry cans;
- Human Factors: IMSAFE;
- Refuelling from drums and fire prevention.

If you wish to contribute to the knowledge base, or feel we need more facts there, let us know.

DIGITAL LEARNING

Still in its infancy, our online learning system is growing every month. You can now undertake training and an exam for both Weight and Balance and L1 Maintenance.

We are developing this system more slowly than intended, but we want to ensure we provide training solutions across the entirety of our membership, so some learning tools are being offered in different ways. We've sent a lot of resources to local CFIs and are working locally to engage with members at a grass roots level.

We've also created a dedicated YouTube channel with a lot of learning material on it. Check it out. There's a link at the top of our home page.

MEMBER'S CLASSIFIEDS

Part of my ethos as a CEO focuses on continuous improvement and evidence based analysis. Just as pilots learn every time they fly and, if they are in for a rough landing, they choose to do a go around. Well, in essence, RAAus has done a go around with the Member's Market.

In July last year we started to have some concerns with it. The number of classified ads appearing in *Sport Pilot* were dropping and we were hearing members weren't happy. The evidence was showing we had a problem and needed to improve.

In October, the board resolved to adopt a new strategy and in January we launched Aviation Classifieds, a classified website for members and non-members alike.

The change had an instantaneous effect. Members immediately took to advertising their aircraft again. Within a week the site had been visited by 3,000 people and received over 20,000 page views.

We've got it right this time and we changed because of your feedback and the data we saw for ourselves.

SUMMARY DATA

The table above shows a summary of our digital footprint in 2016 compared to 2015

CONCLUSION

We started off by asking the question, has our digital strategy worked? From my perspective as CEO, I say yes, it has. But we can still improve. Our members are mechanically minded. They love tinkering, they love flying and they love communicating with each other. Taking to our digital strategy, like our members take to an engine block, has been a little slow, but the signs are good. We've developed everything with the end user in mind. We've made our interfaces simple to use, and integrated where we can, and we have communicated, adapted and improved once we've had feedback and evidence to make a change.

The moral of the story is that RAAus is adaptable and we want to continue to build a platform which is simple and easy to use.

Just as we adjusted the price of *Sport Pilot* based on feedback and the re-introduction of the Members' Market. Now more than ever your feedback is important.

RAAus has learned from the past, but we are not living in the past.

Tell us what you want your future to look like.

More on codes

BY DARREN BARNFIELD **NATIONAL TECHNICAL MANAGER**

A LARGE number of RAAus aircraft have been identified using the wrong codes programmed into their transponders.

If you have a transponder fitted it must be calibrated. It is not permissible to mark the unit as unserviceable.

A correct Mode S address issued in Australia is a 24 bit and 6 digit HEX number in the range 7C0000—7CFFFF 3 (7C is Australia ICAO). This CASA allocated HEX ID must be correctly programmed into the transponder by an appropriately qualified person (LAME) and tested to meet CAO 100.5 requirements. The registration number for the aircraft should not be used as the Mode S address. For example, '241234' (for aircraft registration 24-1234) is not the correct Mode S address, even though the transponder may allow this to be configured.

Good address example:

Mode S: 7C1234 *Flight ID:* R1234 Mode3A: 1200

Bad address examples:

Mode S: 241234 (not a 7Cxxxx number) *Flight ID*: R241234 (contains too many numbers – should be 'R1234') Mode3A: 1200

Mode S: 100000 (not a 7Cxxxx number) *Flight ID*: SLING (wrong Flight ID format – should be 'Rxxxx' *Mode3A*: 1200

A registered HEX code must be obtained from CASA by emailing, aircraftregistrar@casa.gov.au.

RAAus members should also refer to the CASA Airworthiness Bulletin: AWB 34-015 Issue: 2

https://www.casa.gov.au/files/awb-34-015-issue-2-assigning-transponder-aircraft-address.

In addition, advice from Airservices has confirmed the details required to be displayed in the Flight ID field. This should be programmed as 'R' then the last four digit identifiers in the aircraft registration e.g. R1234. This allows Airservices to distinguish the return interrogation as a recreational aircraft and prevents errors being generated in the ATS classification framework.

Aircraft distributors, owners and operators are required to comply and take immediate action where required.

RAAus members who have an aircraft identified by Airservices with an incorrect flight ID will be given 14 days to have the error corrected (a written request for an extension due to engineering availability can be requested from me). A copy of the correct Flight ID and logbook statement is to be emailed to tech@raa.asn.au.

Further reference to the requirement for the operation of an aircraft fitted with a transponder can be found under SECTION 12.4 INSTRUMENT & TRANSPONDER CHECKS in the current Technical Manual Issue 4.

Jabiru: the new generation

STORY AND PICTURES BY ALAN BETTERIDGE

WHEN Jabiru first displayed its 80hp 2200, four cylinder engine at the 1995 Sun 'N' Fun, the industry sat up and took notice.

Here, for the first time, was an Australian manufactured engine specifically designed to suit the needs of the burgeoning ultralight aircraft market.

By 1998 the 120hp 3300, six cylinder engine had joined its smaller sibling and it too received a warm welcome.

Up until that time, home builders in particular had a limited choice of either an imported engine or an automotive engine which had been aviationised.

Now they had a choice of engines with the advantage of the manufacturer being based in Australia.

In the intervening years the engines have undergone changes and constant updating.

As technology changed so did Jabiru engines. New manufacturing techniques were adopted to ensure the engines were always state-of-the-art. As each year went by Jabiru updated the design.

Many words have been written about the CASA fiasco in regards to Jabiru aircraft engines.

Needless to say the methodology CASA used to arrive at its findings was open to question at best. For CASA to include in its findings inflight engine failures due to fuel starvation was something which had many people scratching their heads.

You can hardly blame the manufacturer for an engine running out of fuel.

Battered and bruised but still punching, Jabiru has pushed ahead and, in the coming months, will introduce its fourth generation of 22/3300 engines.

People who visited the Jabiru stand at Oz-Kosh in Narromine last year were given a sneak peak of the new powerplant.

The company had a J120 on display fitted with the new engine and flown down from the factory in Bundaberg.

The installation was neat and tidy and left many owner/builders impressed with the quality of the fitment and layout.

George Moore had flown his own Jabiru from his property in northwest NSW and was more than happy with what he saw on display at the Jabiru stand.

"I have had my Jab for a few years and never had a moment's trouble. When it comes time to either update the engine or replace the aircraft, I would be happy to use these new generation engines," he said.

"The best part for me is knowing if I have a problem I can pick up the phone and speak to someone at Jabiru. Someone who knows what they're talking about.

"It is really about peace of mind," he added.

Jabiru's Business Manager, Sue Woods, says the engines are all about

Jabiru Aircraft owner and designer Rod Stiff with the J120 which was fitted with the Gen 4 engine at last year's Oz-Kosh in Narromine

Jabiru Business Manager Sue Woods

evolution, not revolution.

"The fourth generation engine takes all the good features of our current engine and adds to them," Sue says.

"We didn't set out to re-invent the wheel and the fourth gen engines are more of a refinement to an already highly respected engine.

"Each generation offered something new, was designed to use the latest technology and benefit from what we have learned over the years.

"The current engines are a quantum leap from those introduced to the world in 1995," she says.

"And this fourth gen engine continues that evolution."

The heart of the engine are the aluminium cylinders using nickel silicon carbide bores.

They combine a roller cam, valve relief pistons and a double valve spring top end configuration with the ever durable bottom end in a cast aluminium case. It is easy to see how the new engines will quickly become a standard by which others are measured.

"These new engines offer not only the latest in technology but will reduce or eliminate many routine maintenance tasks," Sue says.

"For example since the heads and barrels are now a one piece component, it will no longer be necessary to tension head bolts.

"No aircraft engine manufacturer can afford to sit back and stick to what they have been doing for the past 20 years," Sue says.

"As technology changes, as new manufacturing process evolve, so do we. As a company we are proud of what we've achieved and, unlike other manufacturers, we have no intention of having our engines built overseas."

Sue said although no pricing for the fourth gen engines had been set by the time of writing, she was hopeful the prices could be kept at current levels.

"The R&D costs for the new engines have been amortised over a number of years. As I have said this fourth gen engine is the evolution of a long line of engines.

"We did not specifically decide to build a new engine but rather have just taken the opportunity to release a number of updated features and manufacturing techniques.

"That said, these engines have been significantly updated so to call them the fourth generation is appropriate."

When asked when the new engines would become standard in all Jabirus Sue was in no doubt.

"The first quarter of 2017 will see all new Jabiru aircraft fitted with fourth gen engines.

"The approvals are in place and manufacturing of components has already begun."

For more information, jabiru.com.au.

Jabiru aeronautical engineer Alex Swan with one of the new cylinder assemblies

FEBRUARY MEMBERS' MAR
CLASSIFIEDS ARE BA

RAAus members can now start their listing with the click of a button in the members' portal. What's even more exciting is that members also receive FREE advertising in Sport Pilot magazine for every ad placed in the new classifieds.

CEO Michael Linke said
bring our members wh
their feedback and we
It's clean, it's simple to
systems and it's very a
mouse and your ad can

Aviation Classifieds is wholly run by RAAus so all revenue stays with RAAus.
Aviation Classifieds, www.aviationclassifieds.com.au is a new, purpose built website seamlessly integrated the with RAAus' database of registered aircraft.

THREE STEPS TO LIST YOUR AIRCRAFT FOR SALE:

1. Once you have logged in to the member portal on the website, navigate to 'Manage your Membership' page.
2. Go to 'Your Aircraft' information and click 'Sell My Aircraft'.
3. Confirm the details to be placed in your ad and pay the small listing fee of $33.

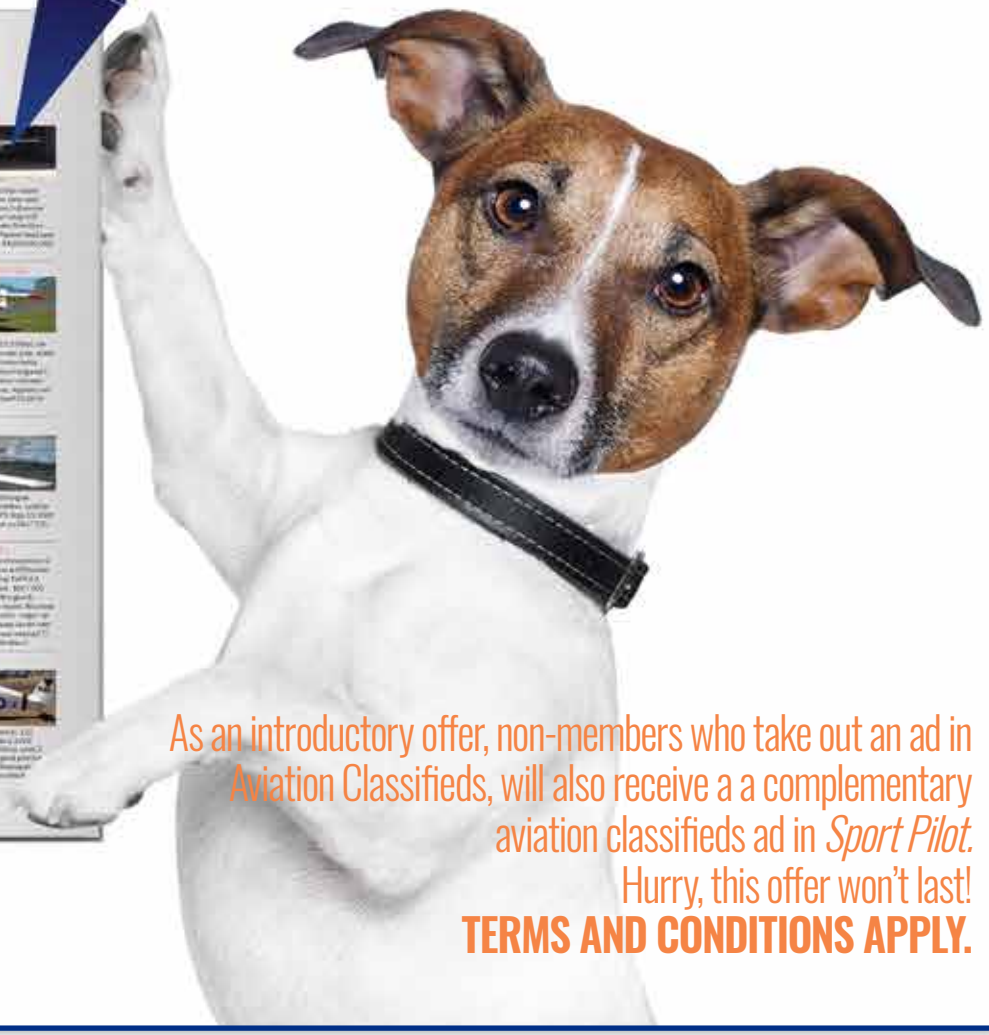
It's that simple.
Your advertisement will automatically appear on the classifieds website and an ad will also be placed in the next available edition of *Sport Pilot* magazine
AT NO EXTRA COST!

RKET ACK!

SIMPLER, BRIGHTER AND BETTER THAN EVER BEFORE.
WITHOUT THE CLUTTER AND WITHOUT THE HASSLE.
CHEAPER THAN EVER!
COMPLETELY OWNED AND OPERATED BY RAAUS.

d, "We are excited to be able to
at they want. We've listened to
've built a product we think they'll love.
o use, it's linked to our existing
ffordable. With two clicks of the
n be online also in *Sport Pilot*.

Sport Pilot is enjoying tremendous success again. Members and non-members alike are subscribing and our online version is receiving thousands of views per month. If you want to sell your light sport or recreational aircraft or anything at all aviation, Aviation Classifieds, powered by RAAus, is the place to advertise."



As an introductory offer, non-members who take out an ad in Aviation Classifieds, will also receive a a complementary aviation classifieds ad in *Sport Pilot.*
Hurry, this offer won't last!
TERMS AND CONDITIONS APPLY.

Bad weather kept many away but blue sky prevailed

- GREAT EASTERN FLY-IN -

FLYING IN THE FACE OF REALITY

WORDS AND PICTURES BY HALDEN BOYD

THERE is a saying that tenacity when faced with impossible odds pays off against adversity. Winston Churchill summed it up brilliantly during World War II, even if people wanted to forget it and gain the spoils it brought with its freedom.

At that time, RAAF Station Evans Head played a pivotal role. Young people, some only in their teens, went brilliantly and full of hope of freedom and bravado, but blinkered, into a smoke and mirror battle to save an empire.

And they went there with the hope of coming back to enjoy beach burned sun tanned skin and sand, the perfect crystal stinging and belting waves, a loving family, a Christmas once a year and the recognised honour from the very community which fearlessly and honestly entrusted and relied on them.

The Empire Air Training Scheme (EATS) Evans Head Memorial Aerodrome was the largest air training facility in the southern hemisphere during the war and out of 5,500 RAAF personnel who trained at the seaside village, around 1,100 or 23% of them, did not return, leaving behind wrecked and traumatised families.

But the proud Evans Head's history faced serious erosion in 1992 when, under the Aerodrome Local Ownership Plan, the federal government bailed out of its legally bound responsibility. Certain community members were quick, including some in local government, to pounce on the government's decision to surrender its responsibility. To those of us involved in aviation on the north coast it seemed the local government authority regarded the former RAAF Station (given to the council as an honour in perpetuity) merely as a real estate cash grab.

Top Cat Savannah

A wave to the crowd

"Aviation is the future of Evans Head"

Thanks to all the volunteers

And so back in the early 1990s, a group of aviators who saw the demise of Evans Head and its unique and important part of local honour and respect, started the fly-in as a small way to try and preserve the airfield.

When the council sacked its local Section 355 Local Government Aerodrome Committee with forceful amalgamation, it flew in their faces. Luckily, after a lengthy public exhibition period, the aerodrome was Heritage listed. The proposal had attracted the second highest number of positive responses in NSW government history. It was a long battle which we won after a very political and down-and-dirty dogfight. But today there are still some who would rather see the aerodrome turned into a real estate subdivision.

Heavy metal thunder

Gyro joy rides were popular all weekend

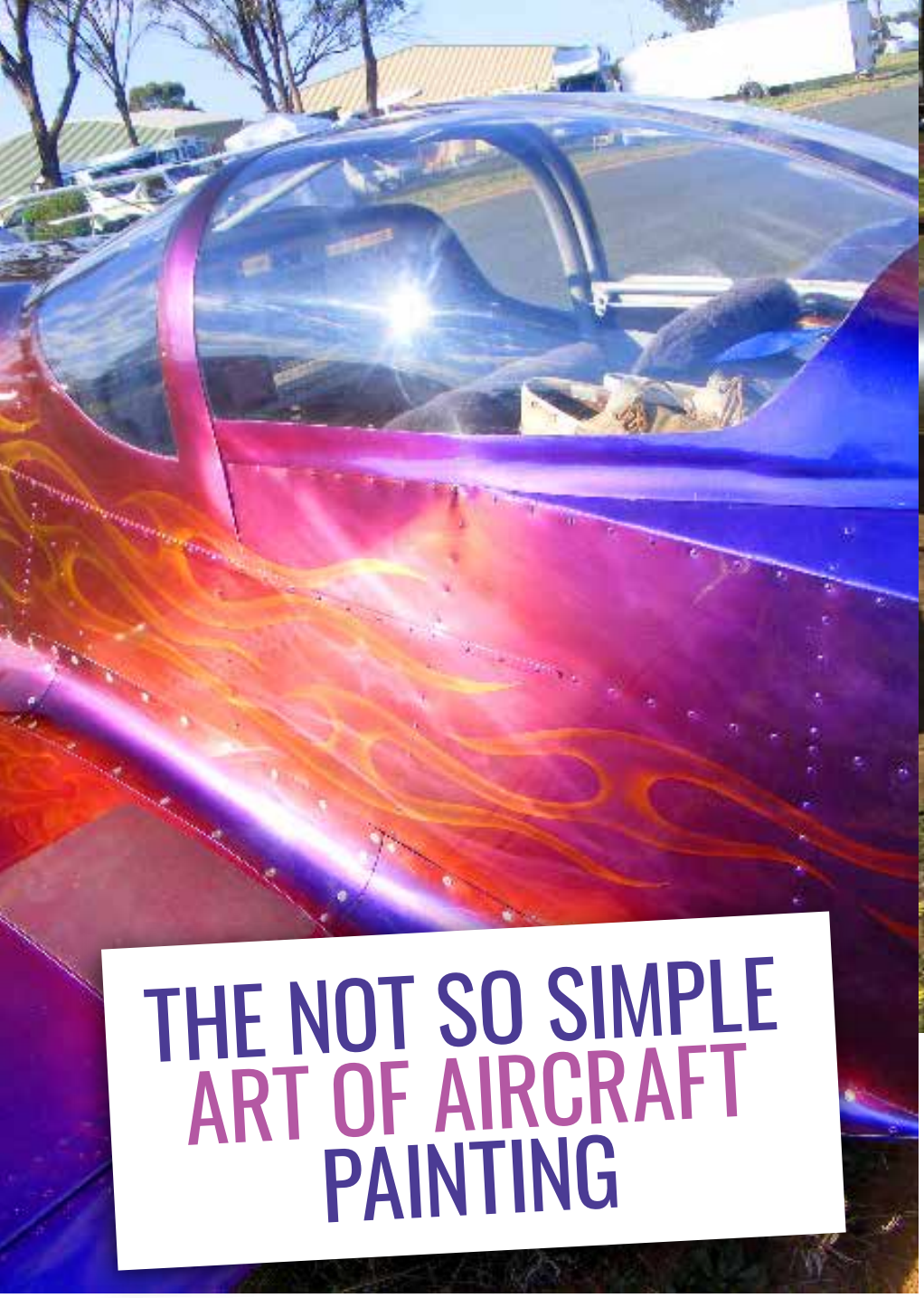
The best seat in the house

Some of the amphibs had a few goes to get there

The fly-in committee is already planning for next year's event and we are deep in negotiations with the Richmond Valley Council for an ongoing five-year development application.

For now aviation is the future of Evans Head. Proposals, such as the development of an airpark on the site, are still being debated, but there are clear skies and positive opportunities ahead for our children and the community at our fantastic aerodrome.

Thank you to all the people who have been involved with the aerodrome since its inception and their ongoing support into the future.



THE NOT SO SIMPLE ART OF AIRCRAFT PAINTING

BY ALAN BETTERIDGE

YOU'VE spent countless hours and thousands of dollars building your new pride and joy. Now is the time to make the decision about whether to paint it yourself or to contract the job to a professional.

Painting is very important since the final finish of your aircraft is most of what others see.

When someone looks at your aircraft, they will also judge the quality of construction by the final finish. They will judge your quality as an owner. How good will the book be, they will ask, if the cover looks bad?

Painting an aircraft is a totally different proposition to painting your car and, as such, there are many traps for an unsuspecting owner/builder.

Col Miller of Maryborough Aviation Services says most aluminium surfaces have a layer of pure aluminium on the surface called alclad which protects the metal from corrosion.

"The alclad is extremely thin and can be easily breached if not handled correctly," Col said.

"An owner/ builder could think they were doing the right thing by sanding any rough areas to help the painter.

"But, in fact, if they breach the alclad layer it will set them up for corrosion problems down the road.

"I have seen one case where the owner, with the aid of a panel beater/spray painter friend, prepared and painted an aircraft only to find it had developed more corrosion six months later than it had prior to being repainted.

"The problem was that the owner and his friend had used an acid activated paint stripper and, although they thoroughly washed it off with a pressure cleaner, some of the stripper had been forced between the aluminium skins where it began its insidious job of corrosion.

"Clearly it became an expensive lesson for the unsuspecting owner."

Col says some builders think they will save a few dollars by helping out with the preparation.

"Unfortunately, in some cases the job ends up costing more because I have to rectify incorrect preparation procedures and methods.

"Even using the wrong type of sandpaper can cause disastrous corrosion problems in the future."

Col says professional painters have an advantage because they have a properly equipped facility, along with top of the line painting tools.

"They are also experienced with the preparation procedure and the painting process itself."

Aluminium surfaces are treated differently depending upon whether the metal is new or used.

On new aluminium, the alclad surface is very smooth and not favourable for paint adhesion. Therefore the surface must be prepared before the primer is applied.

This is normally accomplished by using a conversion coating such as alodine.

This chemical process creates a ceramic layer over the aluminium to coat the surface and allow the primer to stick properly.

With more and more aircraft being built of composite type materials, the issue of painting the surface has become simpler – but there are still pitfalls.

"A number of years ago, a B737 was being repainted and the painters used a Stanley knife to cut the masking tape around the windows.

"The result was deep cuts to the window frames which meant the aircraft no longer met the stringent standards set by Boeing.

"All the frames had to be replaced which

nearly led to the aircraft being written off.

"So, as you see, even the professionals sometimes make mistakes. But if you are using a professional and they make the mistake it is up to them to correct it. If the owner makes the same mistake then the buck stops there."

The type of paint to be applied, from the primer/undercoat to the top coats, was another area owners could make mistakes.

"The type of paint used for aircraft is different to that used on cars or other applications.

"You simply can't pop into your local supplier and buy a can of automotive paint. Aircraft paints last longer, are thinner and more flexible than automotive paints. They are designed to resist temperature changes and are able to flex in flight."

Another issue owner/builders have to consider is the weight of the paint.

"Most aircraft have a far larger surface area than a car. For instance, a C172 has a surface area of around 450 square feet – that's equivalent to around four or five Commodores or Falcons.

"The weight of the paint to cover this surface area has to be taken into consideration when planning. Every extra layer added to an aircraft will ultimately lead to a higher empty weight and less usable weight."

When it comes to custom stripes and special effects, many builders use an airbrushing expert but the trend these days is to use vinyl.

"The vinyl is laser cut to suit whatever the owner wants. After that decision is made, it can take up to two days just to mark it out on the aircraft.

"Each side of the aircraft can be slightly different but the painter must make sure it looks the same when the vinyl is applied."

Col said when it came to laying the vinyl onto the aircraft, it was best left to the person who produced them.

"Once they are on they cannot be moved and if you make a mistake they must be replaced – and they are expensive.

"It is much better the person who makes them applies them. In that case if they make the mistake they have to replace them without charge."

Col said a new paint job should last between 15 and 20 years if properly looked after.

"Owners should regularly wash their aircraft with an approved aircraft wash.

"Using a truck wash is not a suitable alternative. It can penetrate the surface and almost certainly lead to problems in the future.

"It is also a good idea to give the aircraft a wax treatment every year or so.

"It may seem like a lot of work at the time but in the long run your aircraft will look great for many years to come."

The last piece of advice to owner/builders is to make sure they do their research before selecting an aircraft painter.

The internet is a great place to start but before you make the decision to hand over your hard earned cash, make sure they are the people you want.

If possible talk to previous clients. If the company you are considering won't or can't give you names of previous clients, just walk away.

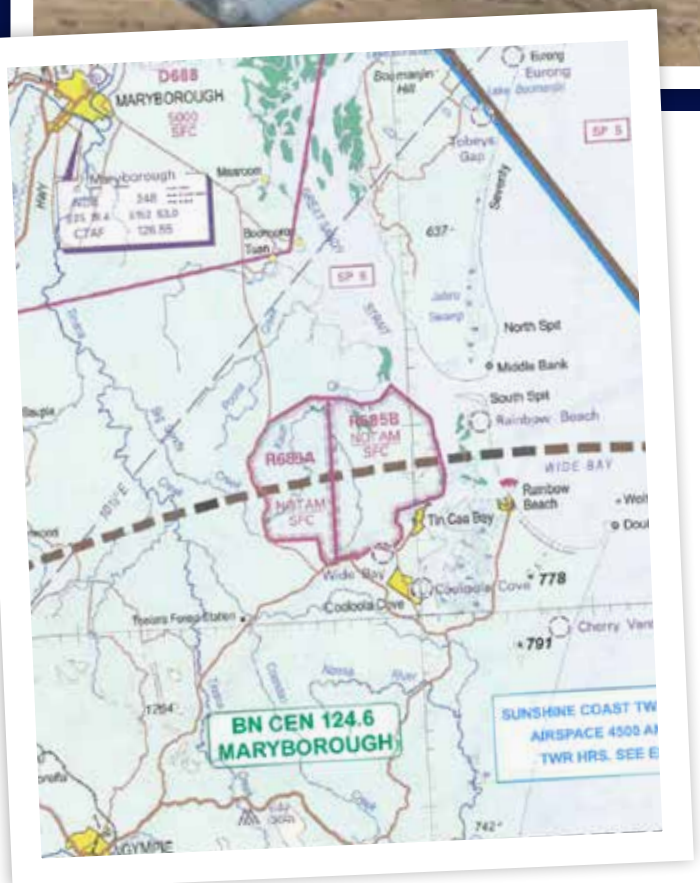
There are a lot of very reputable companies out there but there are also a few not up to scratch.

After all, it's an important and long lasting decision. How your aircraft looks will determine whether anyone wants to park next to you at the next fly-in and how good an aircraft the others will think you have. After all, most of us still tend to judge a book by its cover.

"I really should have known better"

Restricted areas can catch you out

BY BILL HANDLEY **SEAPLANE PILOTS ASSOCIATION**
AND PAUL COULTHARD **AUSTRALIAN DEFENCE ORGANISATION**



In August 2014 I was flying a Lake Buccaneer VFR from Hervey Bay to Caboolture; my wife was with me as a passenger. The route I planned was to track Hervey Bay – Eumundi – Nambour – Caloundra (for landing), which would have taken us to the west of the Sunshine Coast control zone, and then on to Caboolture. I prepared my flight using the WAC chart and the Brisbane VTC which has the VFR route marked OCTA for the Sunshine Coast control zone. At the time of departure there were showers in the area so picking our way around those added some additional complications. Once established on track for Eumundi at 2,500ft it was just a matter of holding on for the bumpy ride.

As we approached Cooloola I gave an overflying call 10nm north on 126.7. The only response was from another aircraft to the east which was bound for the Sunshine Coast via Rainbow Beach. I had contemplated amending my route to the east to avoid the turbulent conditions, but upon hearing his transmission I decided it was probably safer to stay where I was – WRONG!

Here I was about to charge through an active restricted area, R685A/B. Even as I flew over the top (and looked down to what appeared to be army vehicles and soldiers looking up at me) I didn't even think about this place as being a restricted area. When I saw the activity on the ground I actually thought they were working on the airstrip. I later spoke to an army officer who had reported the incident to Airservices and CASA. After that conversation I did some soul searching and self-evaluation about what went wrong:

Shadow unmanned aircraft (extended wings) in flight

Shadow unmanned aircraft (short wings) on ground

Lake Buccaneer

1. I was in a hurry to depart to avoid the rain showers.
2. I relied on the wrong maps – a better map would have been the Bundaberg VNC.
3. Had I used the Bundaberg VNC I would have been prompted to call Flight Service to confirm the status of R685A/B.

The frustrating part was that I really should have known better. I later recalled my seaplane instructor actually telling about these restricted areas during my water endorsement training – it all came flooding back to me after the event. As it was, with the turbulence (wind 140/20) I ended up changing course to Noosa Heads and requesting a clearance through the zone over water – it was a nice smooth ride after that.

The scary part was when the army officer informed me that they had an unmanned aircraft in the air which weighed over 200kg and flew at 70kts. They were just about to catapult launch another one when I popped into view. Imagine hitting one of those!

My aviation background is nearly 2,000 flying hours, with over 1,700 hours in aeroplanes and over 200 hours in helicopters. My ratings include retractable undercarriage, constant speed propeller, twin-engine, instrument rating and floating hull. I thought I was a safe pilot.

Following the incident, I did a lot of thinking about what would have helped me as a pilot to avoid this situation. My primary navigation for that flight was done on the iPad using the OzRunways navigation system which is extremely accurate. However it was only as good as the charts which I had downloaded.

Way back then, the choice of VFR charts was the WAC chart, VNC, or the VTC – too many charts. Since then OZRunways has developed the Hybrid VFR chart which is basically an Australia wide WAC chart but has all the restricted areas, danger areas, control zones and so on displayed on the one chart. They have even gone further and developed the program to highlight air space in red when it is active; it's just fabulous, I would recommend it to all pilots.

Post-Script

The army uses R685A/B to practice firing weapons and to practice fly unmanned aircraft. Some of the weapons used in R685A/B fire their explosive projectiles up to altitudes of seven thousand feet AMSL. This firing can occur day and night and on any day of the week (weekends included). The Shadow unmanned aircraft that army flies in R685A/B can operate up to 15,000ft AMSL.

These unmanned aircraft also operate day and night and on any day of the week (weekends included). R685A/B is located close to and north-west of Tin Can Bay and Cooloola, south-east of Maryborough and north-east of Gympie.

The army conducts weapon firing exercises in R685A/B throughout all months of the year. Army flying exercises for unmanned aircraft in R685A/B usually occur in April/May, August and November.

The army's message is "fly safe and stay away from R685A/B".

RAAus Scholarships

Apply in March

RAAus is pleased to announce its 2017 Scholarship program will open on March 1 and close on March 31.

This year scholarships will be available across the whole spectrum of the work RAAus undertakes. From young people getting into flying, to maintainers and, for the first time, instructors and older people who have never flown before.

Check out the RAAus website from March 1 to find out more and how to apply.

RAAus also invites members to donate to the Scholarship Fund. Simply donate when you renew or use the slip on this page.

Donation to the RAAus Scholarship Fund.

Member name .....

Member number .....

Postal address .....

.....

Post Code .....

Amount donated .....

Name on card (please print) .....

Credit card number

Expiry Date

CCV Number (on the back)

Cheques should be made out to: Recreational Aviation Australia Ltd. Po Box 1265, Fyshwick, A.C.T, 2609

Dearly beloved

BY BRIAN BIGG

The Temptress

I GUESS it's inevitable in every long-term relationship.

My aeroplane and I have been happy together for many years, shared many experiences, been through good times and bad.

Early on our relationship was intense. We rejoiced in each other's company and you couldn't tear us apart. The joy was enough that I wanted to shout it from the rooftops.

We flew everywhere together, even if it was just a five-minute hop along the beach before dark or a one hour squirt to a nearby town for an expensive hamburger. We made many long-distance journeys together, where we learned to be patient with each other's foibles.

We came to know each other's secrets and peculiarities and we forgave each other our weaknesses.

But as with every relationship, over the years we first grew used to each other (we'd fly along for hours not communicating) and then started to take each other for granted. Often I was too busy to show her the proper care and attention. She started to look ragged in places, grubby around the edges and, really, I could have visited her in the hangar more often.

Honestly, it wasn't her. It was me.

Then came the moment a few months ago. As with many such affairs, it started with a phone call from a friend. Dexter, the Australasian distributor for Atec aircraft, rang and told me he was bringing out a new Faeta 321 to Australia. Did I want one?

The Faeta is made by the same people who make my Zephyr. It's basically the same as my Zephyr but with a new wing and a bigger petrol tank. It has all the wonderful flying characteristics of my aircraft but a whopping 34kts more cruise speed (the Zephyr cruises at 100kts) and a 100 litre fuel capacity (the Zephyr has 80).

134kts! That's getting up to the speeds where I used to play in the big, old heavy GA beasts I used to fly. Goodbye bad weather! Who cares about last light? I'll race you there! Woo hoo!

And having a 100 litre tank? What luxury. My 80 litre tank lasts longer than my bladder now. Another hour and a bit's more flying time would be amazing. There's nowhere I could go and have to chuck more fuel in to get home.

Since Dexter's call, I haven't been able to stop thinking about it. I swore when I bought the Zephyr I'd never need another aeroplane. I meant it at the time. And, over the years, I've never seen another aircraft I'd trade her for. She floats like a butterfly and is so forgiving of me. And, despite the harm's way I've put us in several times over the years, she has always got me home in one piece.

But 134kts! The Faeta has all the things I have now, but can take me further and faster. Can I get one?

Being younger and prettier she will, of course, be much more expensive to look after. And, because she is faster I'll probably struggle to stay ahead of her, at least early on. I'm so used to things happening at a pace I'm accustomed to. Hopefully I wouldn't look ridiculous with her. I am not getting any younger after all.

But do I need a new aircraft? Do I need to go faster or further than I do now? Am I just being old and silly or is it just me trying to pretend I'm still young and exciting? Will my friends look at us landing and taxying up to the club house and snigger to themselves "what a fool to fly a totally inappropriate aircraft. His Zephyr looks pretty much the same as the Faeta and has been safe and loyal to him all this time. Why would he change? What is he thinking? A goose."

Am I too old to buy a young and exciting aeroplane? The Zephyr has been with me for 11 years. A new Faeta might even outlast me and be handed on to my son.

These questions have been troubling me since Dexter's call, even as I have been juggling the sums to see if I can even afford a new aeroplane. Very likely the answer lies where it does for most relationships, somewhere in between. Keep the Zephyr, do her up so she looks pretty and start to pay her some attention again. Make an effort to go flying with her more often.

And quietly, on the odd occasion with no one the wiser, go for a jaunt in Dexter's Faeta to experience the thrill of being young and exciting again. Just the occasional flight. No one needs to know.

And so my Zephyr and I will continue to grow old together as I planned all those years ago. Till death do us part.

PEACE, MAN

LARRY & DAKOTA JONES

My daughter and I flying the Cygnet on Lake Alexandrina in South Australia.

The Cygnet is built in Florida and is registered with RAAus as an SLSA aircraft. It is powered by a Rotax 912s (100hp). The big tundra tyres are lowered or retracted via a lever and locked in place. It is very practical and simple to operate, it is also capable of rough off field land and water operations. Our departure point for this trip was the Strathalbyn Airfield and our playground was Lake Alexandrina, part of the lower lakes system just before the River Murray makes its way into the southern ocean. Lots of fun on the lake and a few water landings before heading back to the airfield, undercarriage down, smooth landing, taxi back for a quick hose down and into the hangar waiting for another day of quality father/daughter time. Our Cygnet is available for flight training with the Adelaide Airsports instructors based at Strathalbyn Airfield in South Australia.

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.**

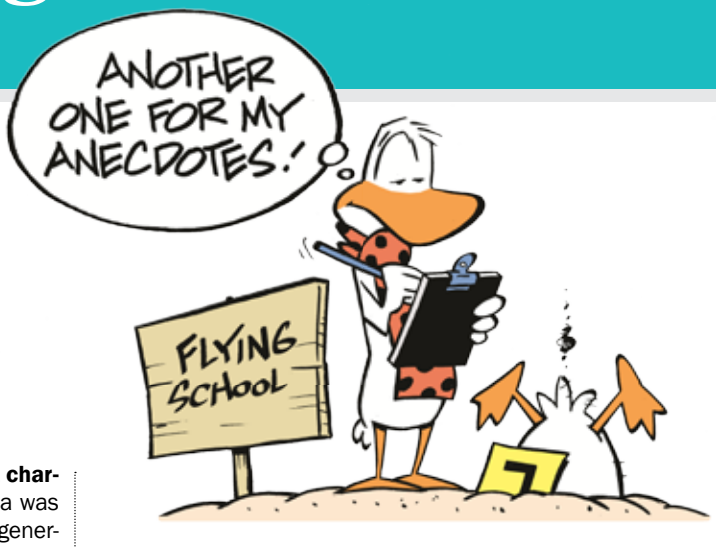
Each edition one photo will be chosen (We will try and make sure every photo sent in gets a run). If you are an aircraft seller, it's a great chance to show off your product.

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.

The great frangible hoax

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.

A FRIEND of mine named Bert was tasked to conduct a charter flight from Lae to Garaina in New Guinea. Garaina was an old wartime airstrip, a huge 1,600m in length and a generous 30m width. This strip was in the middle of a tea plantation and maintained by the plantation owner, Angus.

It so happened that Garaina was also a very windy place, being somewhat close to the coast.

Bert arrived in a Cessna 206 and had a very long taxi to exit the runway at the makeshift terminal. Being a little frustrated with the time it was taking, Bert decided to take a short cut to the terminal. He cut the corner of the parking area, but cut it a little fine and his propeller hit a cone marker.

Now, as all wise aviators know, cone markers are frangible. In other words, they are supposed to disintegrate or be easy to slice through if hit.

So Bert was surprised when the propeller hit this particular marker, there was a loud bang and the engine departed the aircraft along with bits of cowling, oil and other vital parts.

The rather irate pilot stood disconsolately looking at the wreckage when Angus drove up.

Pilot "Why are these cone markers filled with concrete?"

Angus "Well I was sick of chasing them all over the strip in this wind, so I filled them all with concrete to anchor them down!"

The repairs to the Cessna cost well over $20,000, which at the time was a lot of money. The cost did not include the cost of flying the bits and pieces in a civil Caribou to the remote location.

Bert was forced to look for another job.

Lessons?

The airstrip inspector did not explain the importance of frangible cone markers to Angus.

Angus did not show any common sense by filling the cone markers with concrete.

The pilot, Bert, displayed an appalling lack of discipline and airmanship in cutting a corner through the coned taxiway.

As instructors we have a responsibility to promote good Airmanship in our students and stress the need for patience and discipline at all times or remind them they face the often infrangible consequences.

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

The world's first true fighter aircraft, and below, Sopwith Pup 19-8649 also has an exemption to show big rego numbers

PRESIDENT OF THE ROTARY CLUB

BY ANDREW CARTER **TAVAS**

THE Australian Vintage Aviation Society completed its 100% accurate reproduction of a Fokker E.III Eindecker in January 2015.

The aircraft registered 19-8593 was finished in the colours used by Hans-Joachim Buddecke, the third German Ace of WWI to earn the coveted Blue Max. Buddecke, at the controls of another Fokker E.III, is also believed to have been the person who shot down the last Australian to die at Gallipoli.

Therefore, it was important to keep this aircraft looking exactly as it was in 1916. So when we submitted the application to have it registered with RAAus, we applied for an exemption to having to display the rego number along the side, which would have ruined the authentic look of an otherwise perfect reproduction.

Unfortunately, approval to do such a thing was somehow omitted from the previous version of the Technical manual which had been approved by CASA. It then took an extended period to get the manual and process amended, which it now has been in Version 4, section 5.1.

Paragraph 10.5 (Historical replicas) of that section states –

Owners of aircraft which have been built to be operated as an historical replica may apply to the Technical Manager for an exemption from displaying the normal registration marks of para 10.3 above. Exemptions will not be granted to a regular sport aircraft merely painted up to somewhat resemble an historic aircraft.

We submitted the request directly to the Technical Manager, Darren Barnfield, who responded straight away and helped us sort it out. We now have the pleasure of operating a truly unique aircraft under RAAus, but without having to display external registration marking.

This same exemption allows other builders of replicas to display their RAAus registration externally, but in keeping with the accurate look of the subject, as can be seen on these pages on the Sopwith Pup, rego 19-8649.

This is a great step forward by RAAus, working closely with members and now allowing accurate replicas and reproductions to properly represent the aircraft after which they are modelled.

Thanks to the technical team for pursuing this through CASA and making it happen.

"Thanks to the Technical team"

FLYING THE EINDECKER

BY ANDREW CARTER **TAVAS**

THE Eindeker is known as the first true fighter aircraft. It was the first to have an effective synchronisation mechanism, allowing a machine gun to fire through the arc of the propeller.

TAVAS built and flew a 100% accurate reproduction of the type, 100 years after it first debuted on the western front. This is one of only two accurate flying reproductions of the type in the world.

It is powered by a 100hp Gnome rotary engine, which has the propeller bolted to the engine. The entire engine spins around its crankcase at 1,200rpm. It has a single fuel lever, which looks like a throttle, but simply controls the amount of fuel going into the crankcase. The engine has no throttle, it runs at full power or nothing.

The engine is not even fitted with a fuel pump. There is a hand pump on the right hand side of the cockpit, which looks similar to an old fashioned bicycle pump. Above it is the air pressure gauge, which is the most important instrument in the spartan cockpit. To ensure smooth engine operation, you need to keep the pressure in the fuel tank fairly constant, about 1psi. I have read reports which stated this could mean using the pump eight times per hour or more– but I've had to use it many more times than that in just one 12 minute flight!

There are two rotary valves which the pilot can turn to select either of the two fuel tanks. The smaller forward tank is just behind the engine. The larger rear tank is located just behind the pilot. For start up the pilot selects the front tank and pumps in several full pumps of air to bring the pressure up to almost 1.5psi. Starting the engine is a three man operation. One sits in the cockpit, one pulls the prop through and the third very important person stands by with a fire extinguisher ready to put out any fire which starts at the engine, or lights up the fuel which has pooled on the ground.

The pilot then turns the magneto switch to the start position, the crewman pulls the prop through and it usually fires to life first time. The pilot moves the fuel lever forward until he gets what sounds like the best running from the engine (about 1,100rpm). You know if you have moved the fuel lever too far or not enough because the engine revs are low and it sounds a bit off note, indicating the mixture is too rich, or too lean.

So, after all that, I was ready to go.

I gave the signal for the chocks to be pulled away and I blipped the engine. The Eindecker has no brakes so blipping is necessary to help the crew remove the chocks. Blipping is the word describing what happens when you press and hold a button on the control column which stops the spark plugs sparking, killing the engine momentarily. This was the only limited power control on these early engines. They ran at full power or nothing. You have to be careful not to hold the button in too long or the engine will cut out. Pressing and releasing the blipping button is what gives rotary engines that distinct 'burrp, burrp' on and off sound.

Once the chocks and the people removing them were clear, I released the button, the en-

Giving one hand a rest from the (below) very cramped office

The entire engine (top left) spins around the crankcase. Turns happen (middle)just by thinking about them. And a view of the business end (bottom) showing the machinegun

gine went to full power and I was off. There is really no feedback through the control column or rudder pedals. You simply ease forward a small amount on the column, just enough to get the skid off the ground and look over the nose. I had to apply small right rudder pressure to keep straight and used visual clues because I couldn't feel anything through the controls.

In a very short distance (less than 20m) the aircraft broke free and climbed straight ahead with no effort. It is a stable aircraft with a powerful engine. There is, however, a lot of drag, so although you have quite a reasonable rate of climb, it happens at a relatively low forward speed (around 65kts).

Unlike conventional aircraft, WW1 aircraft were built before we had a real understanding of control coupling. As such, each aircraft type feels vastly different to the others and each control surface really needs to be considered individually. The full flying stabilator is completely, ridiculously, overly sensitive. The secret is to lock your arm on your leg and just apply the gentlest pressure with your wrist to change attitude. The Eindecker is fitted with a simple friction control lever at the base of the control column - I assume in an effort to overcome this control sensitivity. We have fitted one to ours and it has definitely helped.

Obviously the well balanced rudder without a fixed fin is also incredibly effective. The first few turns I attempted were done just by thinking about them. When you decide you want to turn right, you subconsciously lead with an almost imperceptible pressure on the rudder and the aircraft starts turning. This is the most enjoyable aspect of the controls and gives a positive feeling.

The wing warping, as expected, does work, but is not the most effective form of roll control. There is a fair amount of effort required (I have to use two hands on the stick), for a sluggish result. However, combined with rudder, balanced turns are easy to do and co-ordinate.

The aircraft cruises at 75kts and the view is fantastic. Each flight is an incredible experience I never take for granted.

Because thre is no throttle, steep nose down descent can cause over speeding of the prop and possible damage to the engine. So I started blipping before I turned base. I held the button in for quite a few seconds at a time, before releasing it just for a second at a time. This 'more off than on' technique allowed me to ease forward and descend quite comfortably. However, anytime I needed to steepen the angle of bank or exit the turn, I had to let off the button, to get a burst of slipstream over the rudder and elevator which instantly energised their effectiveness.

It glides very well (although steeply because of all that drag). I tended to keep the aircraft high and slightly fast and came in steep, just to be able to keep the energy high if the engine failed. I kept blipping the engine all the way into the flare. It allowed me to control the engine and the aircraft very precisely all the way to landing – which is very easy, given the good design and forgiving undercarriage. I simply transitioned through the flare, into the take-off attitude, just above the ground and held it there as the speed decreased, letting off the blip switch momentarily every few seconds, and a smooth landing was assured.

This is by far one of the most enjoyable aircraft I have flown, but certainly not without its quirks and some serious issues. The British test report of a captured E.III stated it would be very tiring to fly in anything but the smoothest conditions. I agree with this completely.

The engine is lubricated by castor oil, in what is called a total loss system, meaning that most of what goes in, comes out. The way the engine exhausts and prop slipstreams, means that most of the oil gets purged out the left hand side. As a result, that wing wears most of the grime. The aircraft requires a thorough clean at the end of each flight, which so far has always taken substantially longer than the flight itself. Although I can't see it, enough of the castor oil (as mist) must spray over me, too, because when I get home, my partner tells me I smell of hot chips.

For more information, www.tavas.com.au

GREAT WAR FLYING DISPLAY

BY ANDREW CARTER **TAVAS**

IN April last year, TAVAS held its inaugural Great War Flying Display, commemorating pilots of all wars. It was able to do so because TAVAS houses the only collection of flying WW1 type aircraft in Australia and operates on an airfield where aircraft from WW2, Korean and Vietnam wars fly regularly. The display also included a flyby of a modern ADF attack helicopter.

On April 22 - 23, TAVAS will host an even bigger and better version of that event, with more WW1 aircraft flying and on display.

The only centenary of WWI we will have in our lifetimes is upon us. While a great deal has been made about Australia's involvement in the ground war, no one has done anything to recognise or promote the significant part Australians played in the air war.

Very few Australians even know that Australian pilots flew during WWI, yet alone that we were the only dominion of the Commonwealth to form our own Flying Corp. Few also know that the last Australian to die at Gallipoli was a pilot. It's not even something which comes up in a search on Google. Virtually no one knows we actually had our own one legged fighter Ace in that conflict.

Pretty much everyone has heard of T.E. Lawrence (Lawrence of Arabia) and his attacks against the Turks in the Middle East during WWI, yet very few know of the huge part No.1 Sqn Australian Flying Corp (AFC) played in supporting him and his operations - despite Lawrence devoting an entire chapter to the No.1 Sqn in his autobiography.

Australians aren't even aware of how it was our airmen of WWI, combined with aircraft from that war, which went on to found the first airlines here (Western Australian Airlines, followed a year later by QANTAS). It was Australian pilots (brothers Keith and Ross Smith) who were the first to ever fly from England to Australia at a time many believed it to be impossible (in 1919 it took 28 days as opposed to the less than 28 hours it takes now).

TAVAS plans to change all that. We intend educating Australians about the significant part Australia played in the air war of 1914-1918 and how that, in turn, changed the face of Australian aviation after the war. We have an aircraft, the Eindecker, which represents one used to shoot down the last Australian to die at Gallipoli. We have an aircraft flying in the colours of those operated by Australia's one legged fighter Ace. We have a Bristol fighter painted in the colours of the one Ross Smith operated with 1 Sqn AFC and scored 10 of his 11 victories. In fact, we flew that aircraft alongside current 1 Sqn aircraft in June 2016 to highlight the centenary of 1 Sqn operations. We literally flew their first fighter attack aircraft alongside their latest.

With the success of one show behind us, and with far more time to organise the second one, we realistically expect a large show with far more people and aircraft in attendance. The same number of flying displays as last year will take place, but with more aircraft taking part.

We will have several pre-WWI types on display, plus more WWI types than we had on display last year. We should have at least twice as many WWI aircraft flying than last year. The star attractions will be the two 100% accurate reproduction Fokker fighters, both fitted with rotary engines, which always fascinate all who see and hear them. There are only three rotary powered aircraft flying in Australia and TAVAS owns two of them. We will have a third rotary engine on a display stand for people to see up close and personal.

The Great War Flying Display will honour all pilots who flew in war. It is an important undertaking to raise awareness and educate people about this largely forgotten, yet very significant, period and of our part in aviation history.

For full details about the event including flying display timetable and a list of aircraft expected to be there, www.tavas.com.au.

Flying better circuits

BY OWEN BARTROP

THE PREVIOUS ARTICLES IN THIS SERIES COVERED TOTAL AND PARTIAL ENGINE FAILURE AND HOW TO PREPARE YOURSELF FOR THEM. THE SUGGESTIONS POSED IN THIS ARTICLE ARE EXPRESSED AS A GENERAL IDEA WHICH COULD HELP YOU CONTROL YOUR AIRCRAFT AND MAKE FLYING SAFER. SOME PILOTS MAY NOT BE ABLE TO ADOPT THE SUGGESTIONS BECAUSE THEIR AIRCRAFT ARE EITHER NOT DESIGNED OR CONFIGURED TO DO SO.

ANALYSIS shows that more than 60% of the incidents and accidents involving RAAus registered aircraft occur with aircraft leaving the runway. Probably, this figure should be higher because some pilots will not have reported an incident if there was no damage or injury. All such instances should be reported, though, because it might save someone else's life.

Before getting down to the nitty-gritty of how to stay on the runway, let's examine the forces which can cause take-off and landing problems: Mechanical failure, uneven tyre pressures, uneven soft runways, aircraft configuration including C of G, poor circuits, failure to overshoot and, of course, wind and turbulence, the later being a major villain.

Looking at this list, you can see there are many hazards to taking off and landing. Mechanical failure is usually out of the hands of the pilot, but a small problem is capable of distracting the pilot and causing an accident, even if the problem itself is not serious enough to cause one. Previous articles in this series suggested the pilot must consider all aspects of each segment of a flight before attempting that part. Before taking off, consider what you would do if there was a mechanical failure. That way, if a failure does occur, you don't get such a surprise you remain riveted to the seat, unable to take timely corrective action.

Uneven tyre pressure increases wheel drag on one side of the aircraft and, as a consequence, the aircraft will tend to veer towards that side. So when doing a preflight, don't just kick the tyres or try to assess their suitability for flight by eye. Think about when the pressure was last tested and ask yourself, is it time to do it again? This is why we do a walk round. To check each and every aspect of the aircraft's suitability for flight.

On grass runways where there has been heavy rain or those built on a sand base, softness can develop in their structure which can increase wheel drag. On take-off, if rudder or nose wheel steering is insufficient to keep straight, don't hesitate to use differential braking to stay on the runway.

(Because this article is written as a general guide, it does not take into account how a particular aircraft is constructed. One of the major issues can be the aircraft's braking system. There are several setups for applying the brakes but individual foot operated brakes are the easiest to apply, because hand operated brakes require the use of a hand just when you need both hands to do other things).

If your aircraft does not have toe brakes, is it possible to retro fit them? It is worth it if you can, it may prevent an accident. Obviously only carry out modifications to your aircraft if permission is granted by the manufacturer.

Student pilots should heed what is written below but obey their instructor. He or she knows what is best. If you want to try something different, talk it over with your instructor. You never know, you may be able to try some of the suggestions in this article.

"If you are having problems controlling the aircraft, stop before it gets hurt'"

Now we get to the most important part of keeping your aircraft on the runway - the circuit. A poor circuit usually results in a poor landing, so get the circuit right and most of your landing problems will disappear. Light aircraft are susceptible to strong winds and turbulence. There is no excuse for departing the runway in an unusual manner on take-off. If you find you are having problems controlling the aircraft, stop before it gets hurt, taxi back to the line and have a coffee.

If there is a strong wind, there will be turbulence. But ask yourself, how much turbulence and what effect will it have on my aircraft? Can I control the aircraft? How do I cope with turbulence? These are the questions you should ask yourself before arriving in a circuit. And if it's true that a good circuit means a good landing, the question becomes, "how do I do a good circuit in these appalling conditions?"

To most people, the air around us is just that - air. But to a pilot, understanding the environment in which we fly is just as important as understanding how to fly.

So what is the air doing? Imagine a room full of inflated balloons. The temperature and pressure in each balloon will vary, causing the balloons to move. This is exactly what the atmosphere does - move about and change. So how do we know what the result is and how it affects my aircraft? We have to learn to read the signs.

Let us put ourselves at the start of the downwind leg. Am I being blown closer or further away from the runway? Then we turn base and commence our descent. Am I closer or further from the threshold than normal? Now turn onto final. Am I lined up with the runway or am I off line? Am I too far away or too close to the threshold? Am I still being blown off line as I come down final? Am I going to land at the right spot or some other place? How am I going to cope with the wind once I'm on the ground? You need to know the answers to all these questions before attempting to land.

The easiest way to find the answers is to fly the circuit and note what happens. However, don't attempt to land just yet because you haven't finished planning. Overshoot before touching down, go round and put the answers to all your questions into action. Now fly another circuit with your path corrected using the answers you learned on your dummy approach. By the way, when turning base the first

Part 4 of a multi part series on one of the most mysterious aspects of becoming a good pilot

time, don't forget to make a radio call to announce you will be doing a missed approach.

Turning final needs special consideration because, if you get this wrong, it could be fatal. Everyone is taught how to sideslip an aircraft but you need to be cautious about doing it. Sideslipping calls for the pilot to apply crossed controls. On the one hand you apply rudder to crab the aircraft and, at the same time, you correct any wing drop with aileron. There is a way sideslipping in a turn can be safely carried out, but if the wrong rudder is applied, the aircraft could have a wing stall which would be very nasty. Therefore, to ensure you never get it wrong, never sideslip in a turn onto final. In fact, all turns at low speed should be balanced turns.

A turn onto final should be carried out in order to roll out in line with the runway. If you are going to overshoot, do not unduly tighten the turn. The aircraft is already at slow speed and a tight turn will increase the stall speed. If it is impossible to safely do an S-turn back onto the centre line, overshoot, go round and try again. If your turn will roll you out before you reach the centre line, slacken off the turn to bring you in line with the runway.

That covers the process for making a good circuit, without which it is almost impossible to do a good landing and stay on the runway.

NEXT MONTH The landing and how to control your aircraft, even in gusty conditions.

Keeping everyone flying

BY THE OPS TEAM

WHAT DOES A TYPICAL DAY FOR THE OPS TEAM INVOLVE? WELL, WE DON'T THINK WE HAVE EVER EXPERIENCED A TYPICAL DAY. EACH ONE BRINGS UNIQUE QUESTIONS, CHALLENGES AND INTERACTIONS WITH MEMBERS, INSTRUCTORS, CFIS, PILOTS AND ORGANISATIONS FROM AROUND THE COUNTRY AND THE WORLD.

WHEN we are flying our desks and the phones are quiet, we carry out a range of scheduled tasks, such as application review and checking, assessing training and other approvals and developing current and new resources for members - such as manuals, training resources, guides and working with both staff and external agencies such as Airservices, CASA, aerodrome operators, police and other aviation groups.

Out in the field, we conduct school visits, work with CFIs or organisers of fly-ins, conduct instructor renewals and other assessments. These invariably involve travel and it's not uncommon for us to cover more than 500km a day between school locations or to return to an airport, motel and occasionally, the comfort of home.

We are at all times interacting with members and instructors. The questions we receive cover a range of topics. Some are easily managed, usually by referring to the Operations or Technical Manuals or the relevant Civil Aviation Order, but others may require significant research or further questions to government departments like National Parks and Wildlife, Search and Rescue or CASA.

Examples of some of the questions we receive include:

- Can we operate firearms from our aircraft? (yes, with approval from CASA)
- Can we conduct shark patrols on beaches? (not at the moment, but watch this space)
- Can members fly their homebuilt into CTA? (depends on a lot of factors)
- Can I take my dog flying? (yes, again with approval from CASA)
- Can other members of my family train in my amateur built aircraft? (only if they assisted with the building and are noted on the building information)

Often we get calls from the Joint Rescue Coordination Centre (Search and Rescue) checking on overdue aircraft or reporting accidents and incidents at airfields. This has a knock on effect of requiring us to make further phone calls to pilots or aircraft owners to see if they are on the ground, or following up with police and emergency services.

We may also receive a call from our counterparts in the other sport aviation organisations, asking about aircraft or members or because they have received a question and need our assistance to answer it. Within RAAus' information sharing guidelines, we routinely share relevant information. They share with us, too, when we have a question of them.

Operations also routinely receives questions about things we aren't really responsible for, such as aircraft registration requirements before, during or after test flying, changes of ownership and addition of new partners to syndicates (These are the Technical department's areas), renewal or gaining a CASA issued Recreational Pilot Licence or subjects like the installation of ballistic parachutes and transponders.

We follow up complaints from the public about all manner of flying vehicles and their activities, noise complaints, complaints from members about each other, complaints from CASA and external agencies like police, National Parks and Wildlife, local councils and aerodrome operators.

CFIs call to discuss operational matters involving instructors operating under them, processes for converting pilots from other organisations, questions about legal, administrative and business requirements, concerns about other operators or pilots at the aerodrome, contractual issues, working with children checks, ASICs and for assistance with their renewals. We assist as much as possible but sometimes these questions are

outside our areas of expertise and have to be referred to lawyers or specialists.

Other questions we receive cover an amazing variety of topics. Due to time differences in WA, SA, Qld and daylight saving, phone calls can be received at strange times of the day and night.

Last year Jill was woken at 2am by a phone call from someone asking for her help to fix a flat tyre. Blearily trying to work out why a member would ring at that time of night (we are day VFR after all), she realised the caller had done a search in South Australia for the Royal Automobile Association and found our website www.raa.asn.au. He then called the office number and, when prompted by the choice for an emergency, pressed 1 and got Jill - hers is the designated emergency after hours number. Jill politely told him he had the wrong number and went back to sleep.

Actually it is not unusual for Operations to receive phone calls late at night. Sometimes, CFIs work late, catching up after a busy day, have a pressing question which needs an answer. Sometimes members don't realise, like them, we actually finish work at 5 pm and call after dinner. And at other times, it's the dreaded phone call from a police department about a serious or fatal accident.

So the phone calls, text messages, emails, faxes and even letters come from members all over the country and prospective members from overseas.

In the main, the challenge of managing these wide variety of questions and enquiries is the best part of the job. It makes us think about different areas for which we are responsible, it can provoke change and force us to re-assess what we do and how we do it.

One recent, and particularly tricky, query related to a member who had recently purchased a waterborne aircraft. A specialist in the aircraft from overseas planned to visit Australia over the Christmas break and the member asked if it was possible for the specialist to provide him with instruction. This made sense, because the overseas specialist was reportedly one of the highest time waterborne instructors in his country, so the experience would greatly benefit the member. Not only did Operations have to review the specialist's qualifications in the busy weeks before Christmas, we also had to research how equivalent these qualifications were to RAAus, ensure a Pilot Examiner was available to conduct his conversion flight and issue him with a RAAus Senior Instructor rating so he could train our member over the break.

Luckily, the Pilot Examiner was also a CFI and willing to have the specialist instruct as part of his school, and confirm the specialist could speak English well enough to meet radio requirements. To further complicate an already complicated story, the CFI/PE under whom the specialist would operate wanted to add his own waterborne endorsement at the same time. So, after the specialist was assessed and issued a Senior Instructor rating, he then flew with the CFI/PE and issued his own waterborne endorsement to the CFI/DE. Finally, the member who made the initial request was able to fly with the newly endorsed specialist and receive his own waterborne endorsement.

And all of this was accomplished before the office closed on December 23. Phew!

So next time you call Operations, if we sound a little distracted, we are probably busy trying to keep everyone flying.

#professionalpilot

BY ANTHONY SIBARY

SEVERAL years ago, having decided I wanted to fly, I headed to my nearest GA airport for my Trial Introductory Flight. On arrival, I was immediately impressed with the complete professionalism of the school. But this was going to be expensive and I did wonder why I should spend so much money learning to fly in an aircraft older than I was.

Having completely underestimated the costs, I soon ran out of money and it appeared my dream of flight would remain exactly that, just a figment of my imagination.

Fortunately, a work colleague, himself a GA pilot, suggested I try RAAus at the Oaks. I took his advice and spoke to Dave Rolfe and the rest, as they say, is history. Yes, it is in the past, but it has so much to do with the present too.

I had ridden past the Oaks airstrip (YOAS) plenty of times, but my first time actually visiting the place was the day I met Dave. It became immediately clear that this was not a big business airport. If I'm honest, I didn't even think my little 2wd sedan would make it along the dirt track into the place and why were there so many abandoned vehicles and decaying fuselages everywhere?

I wondered if other prospective students before me had simply turned around and gone elsewhere, maybe deciding to give up on their aviation dreams along that dirt track. But I had come this far and so decided it was worth a shot. Fortunately for me, meeting Dave and John Taru literally changed my life. I was impressed by their professionalism and their regard for safety, both mine and theirs.

Sure, the facility was nothing like the big airport, but it was about one third the cost. And besides it's not the buildings or whether the instructor is wearing a monogrammed shirt which makes a successful flying lesson, but the quality of the instruction. Not only was I going to save a small fortune, I was going to get professional instruction in a modern composite Australian made aircraft...awesome! And just to be absolutely clear, my experience at the other place was great, but was not something I could afford to continue at the time. If I was going to become a pilot, RAAus was the only way to go.

In a previous issue of *Sport Pilot* I mentioned I'm not a professional pilot. But I always try and fly in a professional way. Over the past few years I have met plenty of aviators who do the same. But what about when we are not in the air? How do we act and behave at the airfield? Are we open to visitors and potential aviators spending time with us, or are we too busy doing all the things we do when we are about to go flying to care or show an interest in others? Or is that too many questions for one article?

I get it, not everyone is comfortable conversing with strangers but that's cool. Your time and money is valuable and you just want to get in a plane and fly.

But recently I've learned that we are the ones who will determine whether our sport grows or dies. If folks feel unwelcome at our airfield, there's a big chance they will not be back. Even worse they might take to social media to share their negative experience and that news travels incredibly fast. You may need more than a hashtag to save you.

I hadn't flown for a while but finally had the cash and the weather on my side, so out to the airfield I went. The drive was uneventful but as I negotiated the track which leads to the flight school, a vehicle blocked my path. It's OK, he may not have seen me. I cruised slowly behind him to the parking area then he parked very close to my driver's door and I had a tough time getting out of the car.

Before I had a chance to speak, the driver, an elderly man, unloaded a verbal barrage at me; complete with a very descriptive account of how I had been speeding down his track and how he'd seen me doing it the day before.

I tried to explain that it was the first time I had been there in months, so he must have mistaken me for someone else. And, in any event, it really wasn't possible to speed along the rutted track in my sedan. There was no apology. He just stalked off and I was left to contemplate what just happened. One of my children was with me, otherwise I might not have been as diplomatic. Until this encounter, I had never met the man, not had a conversation with him. Imagine if I was there for a TIF or was a first time visitor to the airstrip. Would I return? Probably not.

It is up to us to promote safe, affordable and fun aviation for all. Smiles are free and you only get one chance at a first impression. If you see a new face at your airstrip, welcome them and keep it positive and upbeat. If they see you having fun, they will want to find out more. Professionalism in aviation is not just when we are in the air.

And for those of you who know Dave Rolfe, you will agree he would not look any better in a monogrammed shirt.

Lesson One

BY KEN NICHOLAS

I THINK I'm lucky in a lot of ways, even though I've left it until the tender age of 62 to begin my flying.

I live just fifteen minutes from the airport, the school has a virtually brand new Tecnam P92 Eaglet, well-appointed I might add, and my instructor David and I seem to have hit it off quite well right from the word go.

Having been away from the aviation industry for almost 30 years I wasn't really aware of how far recreational aviation had come. I still had the impression of sport flying taking place in powered hang gliders, and numerous ultralights of various shapes and sizes (not that there's anything wrong with them).

Having no real knowledge of the current or previous models of light sport aircraft, I've been very pleasantly surprised by what I've found.

I guess having confidence and a positive attitude in what you're about to take on is a good way to start something new.

The number of things which led me to feel confident about this, was the same for a lot of aviation enthusiasts. It started with model aeroplanes, from the smallest to some fairly serious radio controlled stuff. Then there was the ten years at Avalon with the Department of Defence, building and servicing aircraft, I set off thinking 'yes, I've got a pretty good handle on how it all works' so I had good reason to have a measure of confidence.

> "It became clear this was not a big business airport"

Working in the industry also teaches you to have a healthy respect for safety and the unforgiving nature of this activity. And the need to keep one's eyes well and truly open to what's going on around you. I have witnessed a couple of near misses, so even though I approach it with confidence, I also have a healthy respect and a cautious approach to flying.

As a mechanic by trade I've always wanted to know how things tick.

Pre-flight checks is where I started as a student. My instructor led me round the exterior, showed me the major checkpoints, explained to me how to examine things and what to look for.

Something which came up in discussions about the external pre-flight checks was that not many people use a checklist during their walk around.

I was told to refer to the Pilot Operating Handbook. I asked to take it home and make a copy. The same information is generally available of the manufacturer's website.

I found making a copy very worthwhile.

With the daily and pre-flight checks done, it was time to go flying. It was a different matter once in the cockpit. There I had a checklist, specific to that aircraft but with a lot of points common to almost all aircraft apparently.

The instrument layout on the panel in this aircraft was fifty-fifty or, more correctly, dual electronic and good old analogue mechanical gauges. The term glass cockpit pretty much described the roughly iPad sized screen in front of me. A smaller display mounted on the right side instrument panel, but canted toward me, displayed the engine parameters and fuel information.

Then there were the steam gauges, self-explanatory. This setup proved to be handy because you could look at whichever you liked to read, whichever was easiest for me to work with, a digital representation of the analogue gauges or the real thing.

So we had backups for our primary instruments.

The glass display, a Skyview, had a six pack configuration which displayed the main flight instruments.

As one who loves technology and likes to push buttons, this was a great little toy and, when I learned it could be configured in different ways, I felt it was very handy.

Then we were going flying, weren't we? It may have seemed like we'd spent a half the day just looking around the aircraft, inside and out, and to be honest with you, I could have easily spent half a day and longer, but that's not what it was all about.

We had a two hour time slot allowing for pre-flight checks and briefing and, with luck, an hour in the air, followed by time for re-fuelling, debrief and log book entries.

Eventually we found ourselves sitting on the piano keys at the end of runway 28 at Lethbridge. This is the main sealed 1,200m runway. David made the call and my instructions were to follow what was happening with my left hand on the control stick, my feet lightly on the rudder pedals.

The Tecnam with its 600kg maximum take off weight, is a surprising little performer on a good day, which this happened to be. Lethbridge is at 790ft with left hand circuits so we climbed out at 700fpm and at 1,300ft we made a crosswind turn, continuing the climb. Passing though 1,800ft we made departing circuit call on climb for 3,500ft heading to the south west of the training area for effects-of-controls training.

It was surprising just how much right rudder I had to keep in while on climb and full power to compensate for the effect of prop wash spiralling back around the fuselage - hitting the left side of the fin and rudder wanting to yaw the plane left. David was right onto me about this and getting the ball in the middle, but this was all done with once we levelled off at 3,500ft. I pulled the power back to 5,000rpm and trimmed for straight and level flight. It certainly took the load off the right foot.

Some time was spent on staying straight and level and on the importance of setting things in order - power, attitude and trim - and how each can affect the other.

It was interesting going through each control for, not only what the control does, but also the unwanted or adverse effects such as aileron yaw and how rudder will not only yaw the plane, but also start you into a spiral dive if you get a bit over zealous and kick in too much.

What was noticeable after that first day out was how my legs felt. Tight muscles because I think my left leg had been fighting with my right leg to see which had control of the rudder. I don't think either won but both suffered. All good fun and I'm looking forward to the next lesson.

Going low and sloping

BY ROB KNIGHT

Part of my instructing career involved training budding agricultural pilots to operate at low level (below 500ft AGL) and onto sloping airstrips. Some slopes were gentle, about 3% (1.5°) but some were worse, about 40% (22°). Like most of life's endeavours, difficulty with this aspect of flying generally diminished in inverse proportion to training and experience, the degree dependent mostly on the individual's attitude.

However, new low-level and strip pilots had a number of common issues to overcome and these would be at least as common today as they were then. The most common ones included neglecting to trim accurately, flying approaches both too high and too fast, losing the strip and not being able to find it again and getting so low in a valley they didn't have sufficient climb angle to get back up to the strip in the distance available. When down among the trees, they flew slipping or skidding turns because they interpreted the aircraft drift incorrectly against the ground, they failed to recognise the increased turn radius required when turning downwind and more. In such an unforgiving environment, any one of these is potentially catastrophic and all stem from a lack of application of basic principles and knowledge which experienced strip pilots consider fundamental.

The first of these principles is that airspeed and turn radius are interrelated. Turn radius for a given bank angle is proportional to the square of the airspeed. By decreasing the airspeed, a pilot reduces the area needed to turn.

Take a situation where, at 130kts in a 30° bank, the turn radius is 2,600ft. The aeroplane will need a valley almost a mile wide to execute a 180° turn. It's simple math – 2,600ft radius x 2 = 5,200ft and a nautical mile = 6,080ft. If the valley being flown in is only three quarters of a mile wide (4,053ft), an early termination of the flight is inevitable. However decreasing the airspeed to 70kts will reduce the radius of the turn to 755ft, which means the pilot can turn through 180° in about ¼ mile of lateral room, or in less than half the width of the same three-quarter mile wide valley.

Remember these figures are theoretical examples only-there is no provision in this simplistic description for air density issues or wind effects (up/down drafts, drift etc) and I don't include issues such as pilot slip/skid control. To confirm my figures, check using www.csgnetwork.com/aircraftturnfocalc.html. Of course, the added benefit of a lower airspeed is that there is more time to see obstacles and hazards, more time to assess their relevance and more time to take reasoned, correct evasive action. After all, it's not much help, when dodging a tree, to immediately fly into a powerline you haven't had time to notice.

Next, for very good reasons, it is not wise to exceed a medium angle of bank when flying in valleys, especially when down low in steep sided ones. When manoeuvring in a constricted valley, much of the terrain is above and beside the aeroplane, and the pilot does not have the visual reference to which they are accustomed. For most beginners this is extremely disorienting and confusing,

making it decidedly hazardous to bank and yank because they are eyeball to eyeball with spatial disorientation. Also, increasing the bank angle beyond 30° rapidly increases the load factor (and thus the aeroplane stall speed) if height is to be maintained and there is none to lose.

It can now be more easily seen that slowing down is a key factor to flying in constricted areas and using a lower bank angle to turn. The lower airspeed, which allows the pilot to operate in markedly less geography, also allows less bank angles necessary to manoeuvre. But there's more.

The lower bank angle has yet another advantage. In a high winged aeroplane, the inside wing usually blocks all view in direction of the turn and shallow bank angles make it easier to diminish this concern.

Another necessary skill is to be able to set the aeroplane up to fly a power-on, steady, steep angled approach to a precisely located flare point. I used 'steady' to mean an approach which has the aeroplane trimmed and in a position where minimum input of all controls (including power) will result in a safe landing. Unnecessary control input during the approach will indicate judgement errors.

A major part of this judgement lies in determining the necessary attitude and power to provide the desired approach speed, and approach angle, for the aeroplane at its current weight and centre-of-gravity position. A steep approach angle provides obstacle clearance with less travel distance and keeps the runway in better view. An experienced and aware pilot sets the aeroplane up for the approach and then, while checking Air Speed Indicator regularly for confirmation, listens and feels the aeroplane tell them of any change to the airspeed.

> "I always used great caution when mixing wind and runway gradient"

BRAIN FREE

This leads to what is arguably the most important ability of all. It's something paramount in all flights but is extra important in operations at low level and when in unfamiliar situations. That is the knack of being able to make the appropriate inputs to control (roll, pitch and yaw) without devoting brain time to it.

Pilots who still can't keep straight with rudder, without having to think about it, are a danger because there is no room available for sloppy flying. There are plenty of these pilots wobbling woefully around at an altitude where it clearly doesn't matter. But if they are ever forced to fly low, their lack of this intrinsic skill becomes a very real liability.

SLOPING STRIPS

When teaching low-level operation and strip flying, much emphasis is put on operating the aeroplane at reduced airspeed. For practicality I use a speed range not exceeding Vx (best rate of climb speed) and not less than Vy (best angle of climb speed). The skills I want to see are whether or not the pilot can get and maintain the desired airspeed (aircraft trimmed) and use the correct attitude, power and airspeed for an appropriate approach.

Many airstrips are one-way so once the aeroplane is committed, there are no go-round options. The pilot must know how to set up and execute the required approach.

Inexperienced pilots usually fly up the middle of the valley. While this may appear safe, it isn't. There is no room to manoeuvre (there is only half the potential room to turn) and often considerable turbulence. Flying up the windward side of the valley in the wind shadow area is preferable to avoid the inevitable downdraught caused by the wind descending into the valley on the lee side.

If a ridge must be crossed, the pilot needs to know to fly across it at an angle of less than 90° to the ridge. This makes a turn away quicker if an excessive downdraught is encountered or the pilot changes their mind for other reasons. Another consideration is, if possible, to avoid having to turn around a vision-blocking bluff to make an approach. Such locations, where these dangers are prevalent, are not suitable for training or use by other than already experienced pilots who can fly the aeroplane without having to think about their actions.

A FLYOVER

Never fly onto an airstrip without doing a flyover. Your life may depend on it. If the strip slopes, do the flyover down the slope using at least Vx, but no more than Vy. Experienced pilots often do more than just a single run. They do several to make sure the data is good. When doing a flyover, to guesstimate the runway length in metres, I use 60kt airspeed, note the number of seconds it takes to complete the flyover and multiply that number of seconds by 30. Thus if 300m is the minimum required, it had better take me at least 10 seconds to fly the length of the strip.

Also note the altimeter reading when crossing the top of the strip and the bottom. Check the surface wind direction if any clues are available (wind shadow areas on dams and lakes are on the upward side of the water, cloud shadows etc). Remember the wind velocity may differ between the top of a sloping airstrip and the bottom where the flare will take place. Check for surface mobile obstacles such as cattle, sheep or deer. Being inclined to move, they will be harder to dodge. Check the runway surface for slope changes, drains, washouts, fences etc, as well as boulders or wet patches. Take special note of the terrain relevant to the approach line and the overshoot line (if an overshoot is possible). Plan the approach path and, where available, the overshoot path. Also consider a go around point. An overshoot might be possible if action is initiated early enough in the approach, so select a geographical overshoot point where one is possible. Be mindful that sometimes airstrips are a commitment as soon as the approach is initiated. If the terrain will stop you getting out, this will be a serious landing and misjudgments are not forgivable.

TOO HIGH

A constant feature of inexperienced pilots flying into sloping strips is setting up approaches which are too high. This is a judgement call and only practice helps. If the altitude of the flare point has been estimated during the flyover, a level, or near level, approach may be available to ease, somewhat, any judgement crisis. Wherever possible, keep the strip in sight. If the aircraft is properly configured and established for a steady approach, flying a normal circuit pattern is straightforward, but the proximity of rising terrain adjacent to many strips precludes this. Terrain causes serious stress because many pilots are hesitant to get down into a valley.

To operate in such areas, it must be accepted that the aeroplane will be flying much closer to the terrain than untrained pilots are accustomed. It must also be accepted the high terrain renders the attitude indicator completely irrelevant. In many cases the horizonis now above the top of the windscreen in level flight.

The bottom line is to know your aeroplane, know yourself and acquire the knowledge and experience to help maximise precision, control, performance and safety when operating aeroplanes into terrain restricted or obstacle restricted areas.

Sloping runway takeoffs

CALCULATING EFFECTIVE RUNWAY LENGTH ADJUSTED FOR DOWNHILL SLOPE FIG 1

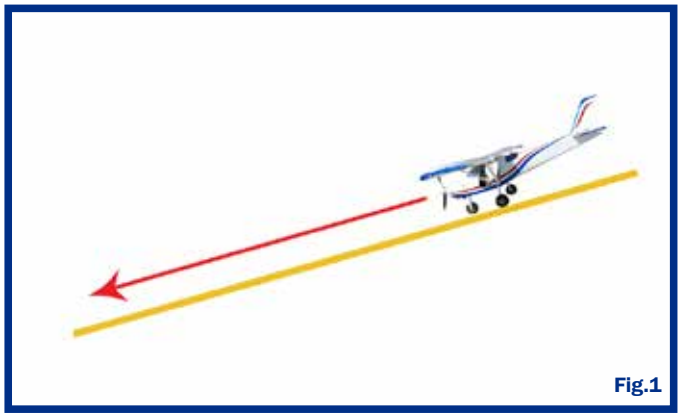


Fig.1

Rule of thumb (downhill only) when considering the effect of runway gradient, every 1% grade equals approximately 10% change in effective runway length. Therefore we can use the following quick calculation to ascertain the effective runway length available.
A 3% gradient = a 30% increase in effective runway length = 500ft plus (.3×500). This will equate to an effective length of 650ft.
A 5% gradient = 50% increase in effective runway length equals 500ft plus (.5×500). This will equate to an effective length of 750ft.
A 10% gradient = a 100% increase in effective runway length = 500ft plus (1×500). This will equate to an effective length of 1,000ft.

LANDING UPHILL WITH A TAILWIND FIG 2

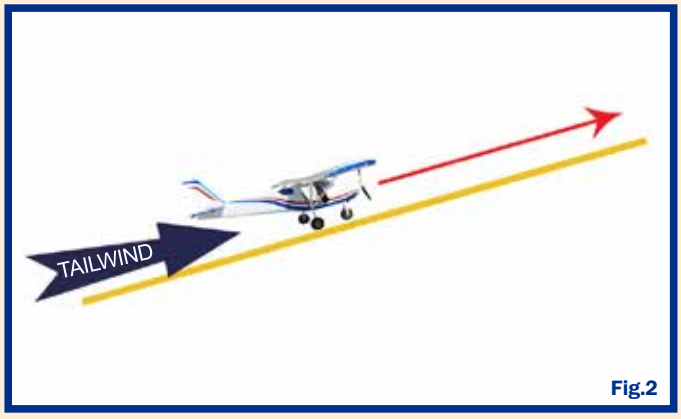


Fig.2

Planning to land with a tailwind should be done with great care. Because a 10% increase in ground speed results in a 20% increase in landing distance, even light tailwinds will greatly increase the ground roll. If the runway ends in a drop-off, such as on top of a plateau or along the riverbank,the pilot should anticipate an updraft over the drop-off on short final. This updraft can cause an aeroplane to balloon or float further down the runway before making a touchdown, and could be problematic depending on runway length and gradient. Additionally, when landing with a tailwind, the pilot will have to fly a steeper approach to compensate for increased ground speed, which can cause visual illusions which can hinder judgement of height and distance relative to a sloping runway.

LANDING DOWNHILL WITH A HEADWIND FIG 3

A strong headwind is required to overcome the increase in landing roll created by a downhill landing. If the wind is strong enough to cancel the effects of a large downhill slope, expect serious turbulence on the approach, particularly if there are obstacles such as trees or buildings. If a faster airspeed is used for the approach to compensate for gusts and turbulence, the increase in ground speed will further lengthen the landing roll when landing downhill. The plane will float and float and float. Pilots may find it hard to touch down because the ground keeps dropping out from under the aeroplane. Once on the ground the pilot must count on brakes to stop. Heavy aeroplanes have more inertia and can be very hard to stop. In Ag training, I never even demonstrated downhill landings, let alone asked a low time left seat pilot to try one.

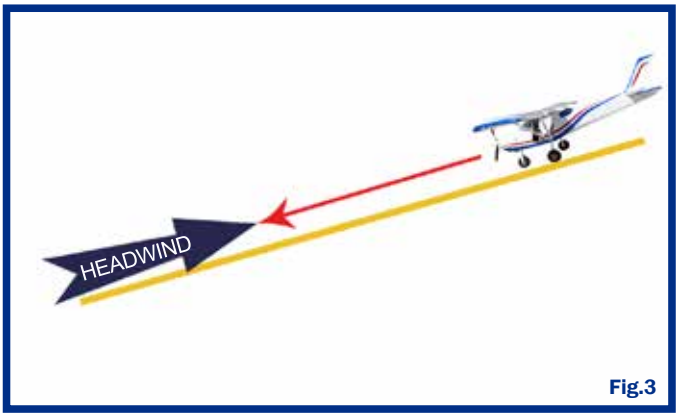


Fig.3

DOWNHILL TAKEOFF WITH A TAIL WIND FIG 4

Considering that a 10% increase in ground speed increases the take-off roll by 20% and every 1% of runway downslope = approximately 10% more effective runway, it takes about 1% downslope to counter every 2 - 3kts of tailwind for most recreational aircraft. Thus a 6 - 10kt tailwind would require at least a 3° downslope to neutralise the effect of wind. If the down sloping runway ends in a drop-off, the plane may become airborne in ground effect but encounter a downdraft over the drop-off once it leaves the runway. Turbulence will often accompany this downdraft. Water below will amplify it. This can be a sticky situation, especially when flying around rugged terrain, whether at the same level or beside a river bed. If no turns can be made and the departure must be flown with a tailwind due to terrain, downdrafts and turbulence may continue along the departure path. The only option for the pilot is to lower the nose, maintain airspeed and try to remain clear of the terrain.

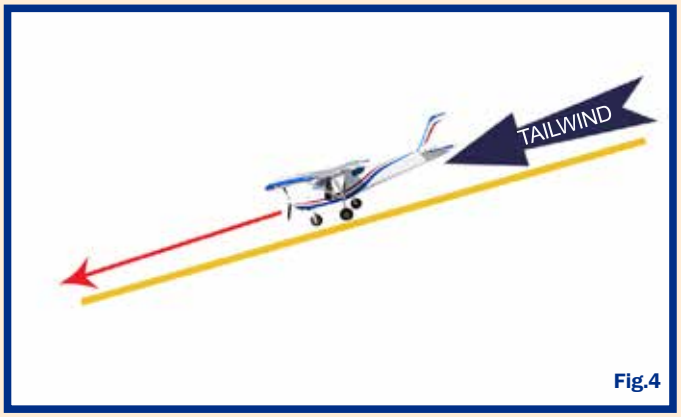


Fig.4

UPHILL TAKEOFF WITH A HEADWIND FIG 5

Based on the relationships of ground speed and gradient, an aeroplane will generally require a significant headwind to counteract more than a slight uphill slope. If the runway is short, choose a take-off abort point. If the aeroplane is not in ground effect and accelerating by that point, it may not out climb the gradient. Aborting a take-off uphill provides more rapid deceleration and less distance than a runway without a slope. Anticipate wind shear and turbulence over trees or obstacles after departure. Also when taking off uphill, chances are the terrain on the departure end of the airstrip also rises and may exceed the climb capability of the aircraft. Not a good choice if any other option exists.

I always use great caution when mixing wind and runway gradient. Many runways with gradients have surrounding obstacles and terrain which can magnify the effect of downdrafts, wind shear and turbulence on approach and departure. On short runways, especially with obstacles in the approach or departure path, landing and taking off with more than a light wind is seldom a good idea and only likely to be appreciated by the aeroplane repair shop people.

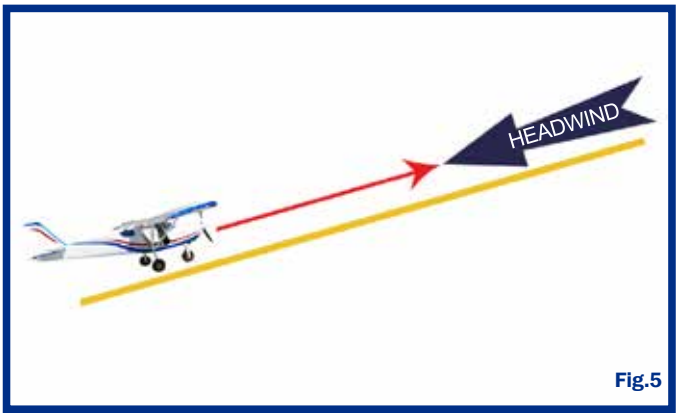


Fig.5

NOTE ***All values and percentage changes depicted in this article are rough figures only, provided for the explanation of the concepts described. Because of the variations in pilot and aeroplane performance, as well as atmospheric considerations, no values are absolute or guaranteed.***

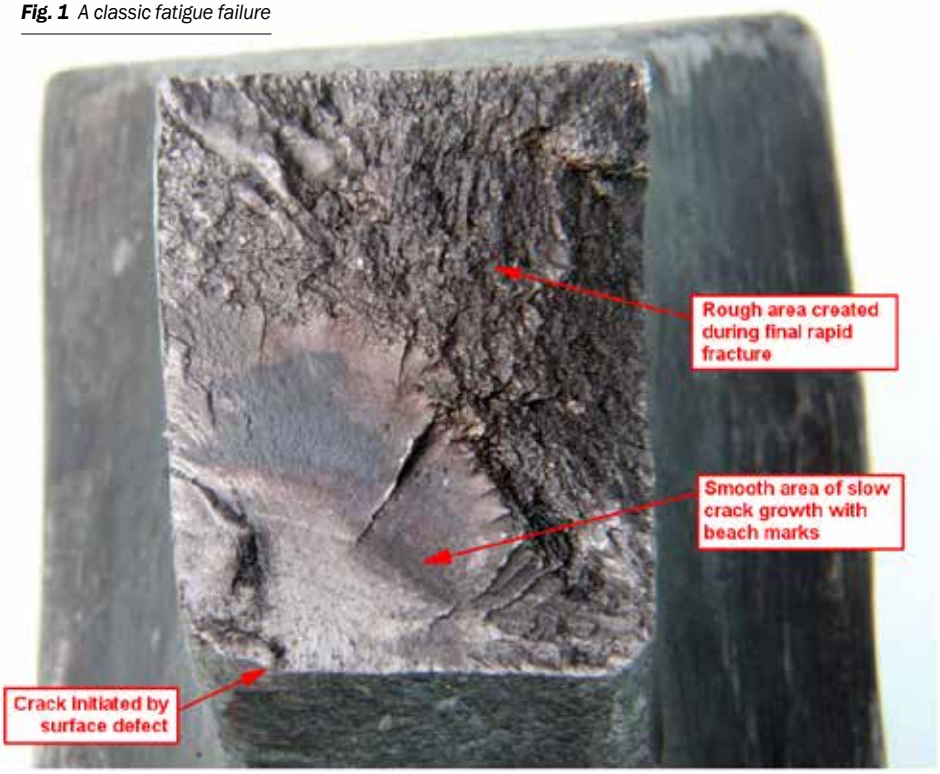
Chronic fatigue

DESIGNING YOUR OWN AIRCRAFT BY DAVE DANIEL

I WAS at an air show recently and more than a little taken aback to overhear someone expressing a view that, "Fatigue isn't an issue for homebuilts, they just don't fly enough hours for it to be a problem."

It's easy to see where this kind of opinion comes from. Certified airframes have fatigue lives equivalent to tens, or even hundreds, of thousands of flying hours whereas most homebuilts will be lucky to collect more than couple of thousand hours in a lifetime; so they should be fine, right? Unfortunately this belief misses the crucial point that certified aircraft are carefully designed and tested to achieve a certain design life, and even then there have been a few occasions when the big boys got it wrong, (Aero Commander wing spars and deHavilland Comet windows spring to mind). Designing for fatigue life is tricky and, just because an aircraft is only going to accumulate a few thousand hours, certainly does not mean fatigue can be conveniently ignored. But before we look at how long your beloved homebuilt is going to last, let's go back to the origins of fatigue.

Fig. 1 *A classic fatigue failure*



AN AGE OLD PROBLEM

In the first half of the 19th century it was noticed some railway carriage axles would fail unexpectedly after relatively short periods in service, despite the fact they operated at loads well below their designed and tested strength. By the 1850's there was a growing appreciation in the engineering community that metal components exposed to cyclic loading displayed a tendency to weaken over time. They dubbed this phenomenon 'fatigue' because it was postulated the material was somehow tiring through use and losing its strength. Systematic investigation followed, revealing that fatigue failures actually result from the progressive growth of initially microscopic cracks. These cracks develop gradually over repeated loading cycles until a part is so weakened that catastrophic failure occurs at well below the designed strength.

THREE STEPS TO FAILURE

Fatigue failure occurs in three stages. Firstly a crack needs to initiate. This will typically occur at a pre-existing surface defect such as a tooling mark, an area of damage or material defects such as a void or contamination in a casting. However, even apparently defect free highly polished parts will initiate cracks eventually, triggered by tiny imperfections in the material microstructure. For a part with good surface finish and no damage, the first 90% of the fatigue life can pass with no cracking visible to the naked eye.

Once a crack has initiated, it will then go through a period of slow growth extending by a tiny amount with each load cycle. Despite being damaged, a cracked part can remain serviceable in this state; provided the design loads are not exceeded and the crack is shorter than the critical length, the part will not fail catastrophically. Finally, after a period of crack growth which may last months, or even years, in service, the length of the crack will reach a point where the rate of growth increases exponentially, rapidly leading to final failure of the part.

This fatigue process is clearly visible when examining the failure surface of a broken part as shown in Fig.1: A crack has initiated from an area of damage (in this case a tool mark) and has then grown slowly over repeated loading cycles, creating a fairly smooth but subtly 'beach marked' region similar in appearance to tree rings. Finally the crack has grown large enough that the remaining material lacked the strength to carry the load and the part has failed, creating a large rough area indicative of rapid fracture.

AN OLD AGE PROBLEM?

It should be clear by now that fatigue life is not actually about age. Instead the primary criteria involved are the number and magnitude of the loading cycles. Low stress loading cycles are much less damaging than high stress ones and will cause failure to occur far more slowly. To give a couple of examples: Landing gear legs see large stress variations with each take-off and landing, which is much more arduous from a fatigue point of view, but the number of cycles will be low – maybe a few thousand in a plane's entire lifetime. On the other hand, an engine mount is exposed to constant vibration whenever the engine is running, the magnitude of the stress variation is low but the exposure is huge – even if you consider only the vibration directly due to the firing of the cylinders. A Rotax four stroke produces well over 500 million loading cycles for every 1,000 hours it runs.

SMOOTHLY DOES IT

If you've built a metal aeroplane, you'll be well aware of the mantra to, "smooth edges and deburr holes", and not without good reason. Burrs and rough edges provide a multitude of tiny 'notches' - sites for cracks

Fig. 2 (above) *Fatigue cracks frequently initiate at holes.*
Fig. 3 (left) *Corrosion not only weakens the base material but provides an opportunity for cracks to develop.*

to initiate and propagate - which can dramatically reduce the fatigue life. But notches are not just a builder's problem. From a design point of view holes, corners, and changes in thickness should always treated with suspicion - after all they are basically blunt cracks deliberately included in the design! Now I'd challenge anyone to design an aircraft without using any holes, but placement of these features is critical and can be the difference between a part which lasts weeks and one which lasts years.

So why do notches cause problems? Firstly, they cause stress concentrations - small localised areas of higher stress - and secondly, by definition, they are on the surface of the part and so are likely to already be in a high stress area - especially for parts loaded in bending. As a side note, it is this same property of notches which makes corrosion such a problem. Loss of material to corrosion obviously reduces a parts' strength, but the surface damage, cracking and pitting which corrosion creates can be far more critical and have a huge impact on fatigue life.

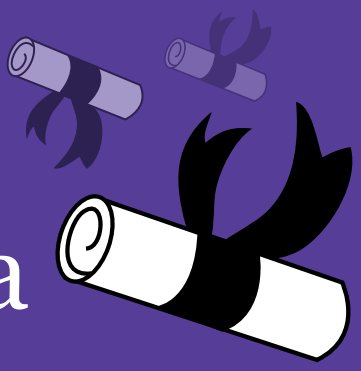
MATERIAL MATTERS

Correct material selection is vital for good fatigue performance. For some metals, such as steel, there is a fatigue endurance limit - a stress level below which cracks won't initiate or grow, providing theoretically infinite fatigue life - providing stress levels are low enough. Unfortunately aluminium doesn't display this property and even at very low stress levels fatigue failures can still theoretically occur - albeit at massive numbers of load cycles. This doesn't make aluminium useless, but it does mean high frequency vibration and aluminium don't play together nicely and probably explains why you don't see many aluminium engine mounts.

DO WE NEED TO WORRY?

Getting back to my air show expert. Was he right? I guess time will tell. Fatigue may well be a lesser problem at our end of aviation, but we are not immune and it's certainly not something we should simply ignore. So, with that in mind, how do designers combat the problem of fatigue? Find out next month.

Win the crowd, maxima



BY PROFESSOR AVIUS **AVIATION GURU**

THERE are many references to maxima and minima in various disciplines, but in aviation I often wonder if the references are fully understood.

In engineering, tolerances are often referred to as GO/NOGO; These tolerances are determined at the design stage and are then used as the basis to determine whether a part or an assembly meets the requirements for the new part; and, subsequently while in service, may be used to determine the continued serviceability. GO/NOGO can be viewed as maximum/minimum (or vice versa) This principle may also be referenced in aircraft maintenance.

Wikipedia defines the mathematical analysis of maxima and minima of a function, known collectively as extrema (the plural of extremum), as the largest and smallest value of the function - either within a given range (the local or relative extrema) or the entire domain of a function (the global or absolute extrema). Pierre de Fermat was one of the first mathematicians to propose a general technique which he called 'adequality', for finding the maxima and minima of functions. As defined in set theory, the maximum and minimum of a set are the greatest and least elements in the set, respectively. Unbounded infinite sets, such as real numbers, have no minimum or maximum.

About here I hear the cry "what the ....?? has this got to do with RAAus, instructors and flying training etc in day-to-day flying?"

Last month we discussed IMSAFE – these can be viewed at maxima/minima; in addition there are many maxima and minima we routinely address in aviation without a second thought (just a short list of examples).

Maxima (Maximum)	Minima (Minimum)
Oil pressure	Oil pressure
Oil temperature	Oil temperature
VNE	Stall speed
MTOW	Fuel for the planned flight
Crosswind	Cloud base

However, there are others: Frequently aspects such as personal minima are frequently quoted. But do we all live by the slogans? At our flying school there are a number of maxima/minima criteria we apply before undertaking a pre-flight briefing, the precursor to a training exercise. Are these set in stone? No. Why not? – there are variables, primarily the students' experience and state of progress: There is no benefit in conducting circuits in the early phases of training if the wind is variable and gusting; but, within reason, these may be just the sort of conditions a more advanced student needs to experience.

Importantly, there is no benefit in conducting any exercise if the student won't learn. I have seen instructors fly with students in conditions which were far from enjoyable and where the student bordered on fright. You have to know when to say no. And when you do say no, you are obliged to explain why. For example, the conditions are above maximum or below minimum.

SETTING PERSONAL MINIMA

This is area where maybe we can do more. The rules are communicated to pilots through different media. For example VFR flight clearance distances/height from cloud; entering/departing the circuit - not listed specifically as maxima or minima, but as a procedure;

But how do we set our own maxima and minima? I doubt there is any pilot who hasn't, at some stage, wished they were on the ground rather than in the air. Setting maxima/minima is very personal, but as instructors we can do more to make a student more aware of the need to set them. The weather forecast isn't always right but, within reason, it's usually pretty good. In planning a flight when the weather is less than ideal, there needs to be some 'what if' factors. If the forecast cloud base is less than 500ft above terrain should the flight even be planned? At that height its definitely below my minima – but does a low hour pilot see it the same way? As a pilots' experience develops, some of the criteria will change, influenced by their own experience and growing confidence.

Ensure that your students are never afraid to seek advice from you. There are days when pilots want to fly but are hesitant (maybe its gusty or at the upper end of their crosswind performance). Step up and provide advice and assurance. Help them define their own maxima and minima and always be willing to go flying with them to provide some refresher advice. If you are hesitant, flying for the day should be cancelled.

Better to be conservative and safe. That's my minimum.

Counting the cost

THE BEST BITS ABOUT BUILDING YOUR OWN BY DAVE EDMUNDS

I THINK we kid ourselves about the real cost of running an aircraft, which seems completely reasonable, because we have no trouble rationalising most of the other decisions we make in life.

For the purposes of this article, let's assume you fly 100 hours a year. This is more than most of us actually do, but will serve the purpose. The more you fly, the more it costs, but the lower the cost per hour.

You have some fixed annual costs, and I will use mine as an example. Hangarage costs $2,000. Insurance costs $891, but you could carry your own. RAAus membership and aircraft registration, $215 and $140 respectively.

I do my intermediate oil changes and services at minimal costs, say $100 per year and pay for an annual service which cost $635 last year. This was a good year. Some of you could do your own, but I prefer to have another set of experienced eyes go over the plane once a year.

I pay $200 every second year for an ASIC card I don't need, and about that again for a biennial flight review I do need.

Turning now to operational costs. I use around 15 litres of fuel per hour at, say $2.10 per litre on average. For 100 hours, that is $3,150 per year or $31.50 per hour. Because I operate out of Goulburn, which has probably the most expensive fuel in the known universe, you may do a bit better.

Engine life is 1,000 hours on my older Jabiru. Taking a more typical example, assume a 1,500 hour engine life, with a replacement cost of around $15,000, or $15 per hour. This assumes nothing other than routine maintenance during the life of the engine, which is extremely optimistic. Mine required a top-end overhaul, which would add another $1.50 per hour to amortise the cost. Rotax engines cost more, but may require less major half-life service.

I think 40 flying days per year is a reasonable estimate for this exercise. Allow $10 per day for landing charges, so that is $400 per year, or $4 per hour.

There are a few extra costs, such as oil, occasional battery replacement, tyres and so on. Allow $10 per hour for these.

The fixed charges add to $4,181 and operational charges to $60 per hour. So, to fly my Jabiru for 100 hours a year costs me just over $100 per hour, and I think there are bits and pieces of cost I missed. For example, propeller wear. I have not factored in depreciation, which is probably around $2,000 per year on my aircraft. You could probably add in another $30 per hour to be more realistic.

If I was to fly just 80 hours a year, which may be more realistic, the fixed costs are amortised against fewer hours. The hourly cost is now $110, plus the extra $30.

I have talked about costs in these articles before. I don't believe that, for most of us, there is much saving in home building. That is something you do for the sheer pleasure of taking on a big challenging project and building exactly what you want. I want a touring plane, and I don't think I can do that much more cost effectively than my Jabiru, although there may be other aircraft of similar capability which can be operated at similar cost.

So, all up, assuming you already own the plane, it will cost you at least $10,000 to fly 100 hours per year, probably closer to $13,000. The figure came as something of a surprise to me when I worked it out.

Reviewing my costs, I don't think there is much I could do to reduce them without tradeoffs. For example, I could do without the hangar, but the sun and weather damage to my aircraft over time would depreciate the aircraft more rapidly, and there may be no saving.

Some years ago I was touring in central Queensland on a particularly blustery turbulent day. I climbed to 9,500ft where it was still turbulent. Traffic in the area was asking for clearance above 15,000ft to clear the turbulence. This got me to thinking what I would need to give me more capability than my Jabiru. Sure I would like more fuel capacity and luggage, and that could be done without much additional cost in terms of aircraft choice. To have the option of climbing to 15,000ft requires oxygen and preferably a turbocharged engine. This would cost a great deal more.

I have always had a soft spot for the Cessna 182. I could cruise faster and further. I could get an instrument rating and that would give me more flexibility. I could not operate a modern Cessna 182 under $300 per hour for a non-turbocharged version. My really nice second hand Jabiru cost $46,000. A really nice second hand Cessna 182 would cost $250,000. Add a fair bit more for the turbocharged plane, and a bit more again for an oxygen system.

For all that extra capability, I would still probably choose not to fly in the sort of conditions I would not fly in my Jabiru. So, the Cessna would give me a more comfortable experience, a bit more range, a bit more flexibility, but not really allow me to go places I cannot already go in my Jabiru. Anyway, I don't have the $250,000 to spend.

The introduction of ultralight aircraft has given us opportunities to fly at lower cost than is possible in the GA world, and for that we should be very thankful. I gave up GA flying after five years because the costs were prohibitive, but was able to get back in with my RAAus registered Jabiru.

Those of us with any sense, cut our coat to suit our cloth. There is not much point in trying to rationalise recreational flying, although we all do anyway. I fly because I can without beggaring my family and, anyway, my wife rides a horse. Flying has given me the opportunity to see our wonderful country in a way few are privileged to do and that is probably enough.

DESTINATION

Hervey Bay

OCEANS RESORT AND SPA

The resort is only a ten minute drive from the Fraser Coast airport which makes it convenient for pilots looking for a place to relax.

The resort has 129 self-contained one, two and three bedroom suites (with spas naturally) and penthouses with private balconies and uninterrupted views of the Great Sandy Strait and Fraser Island. As an alternative the resort also has apartment style accommodation opposite the Urangan Beach Pier.

The tour desk can arrange activities such as whale watching, swimming, boat tours and fishing. Cool off after a long flight in one of two centrally located lagoon pools or find a shady spot in the tropical landscaped gardens and fall asleep.

Hervey Bay is a popular tourist destination. In the winter people come from all around the world to see the whales. At other times of the year, you can rent a four wheel drive and drive along Fraser Island, the world's largest sand island. Or swim (no stingers), fish, sail, dive or ski. There is even the possibility of going by seaplane to the southern reaches of the Great Barrier Reef (35 minutes), doing a sky dive or, if you need even more unwinding, a sunset champagne cruise.

The Fraser Coast is also getting a reputation for good fishing (and good fish restaurants).

Flying the coast around Hervey Bay is well worth the effort and, after tying the aircraft down for the day, the Oceans Resort and Spa is the perfect place to stay over.

For more information, www.oceansresortherveybay.com.au

Fraser Island

ELIZA FRASER LODGE

The other alternative for pilots in the Hervey Bay region is to fly into Orchid Beach airstrip on Fraser Island.
Nick & Ellen, who run Eliza Fraser Lodge will pick you up from the strip. They recommend a stay of at least two nights because Orchid Beach is so remote you would not see anything of the island in less time.
The Lodge has fully catered, all-inclusive accommodation - all you have to bring is your clothes.
All meals are included, as are beach fishing rods and bait and 4WD transport to specific locations at the northern end of Fraser Island (above Indian Heads). Nick and Ellen will also help you beach worm at low tide and tip you the best places for fishing if you need it.
If you aren't flying yourself, Air Fraser Island or Brisbane Helicopters fly to Orchid Beach from Hervey Bay or the Sunshine Coast.

You can request aerial sightseeing on the way over. If you decide to drive in, access to Orchid Beach is by 4WD only and dependent on the low tide. Experience in sand driving is advisable. The best bet is the ferry which leaves from Inskip Point at Rainbow Beach or the vehicle ferry from Hervey Bay to Kingfisher Bay.
By the way, if travelling by road you also need a permit from Department of National Parks.
Probably best to fly in. The strip is reportedly in good nick but as always, always check before you try. The local store is a good source of information about the strip. After landing, wander over and pay them the landing fee. And, once ensconced in Eliza Fraser Lodge, you won't care about anything for a few days but sun, sea and sand.

For more information, www.elizafraserlodge.com.au.

10 X 6FT BOX TRAILER

10 x 6 ft Box Trailer with 2,000kg GVM. Mechanical override brakes, 50mm towball. Please contact 0424 530 225 and talk with Paul.
PRICE **$2,000.00**
CONTACT **KELLY STIRTON 0424 530 225**

X-AIR HANUMAN

X-Air Hanuman. Rotax 912 100hp. 80 Litres Fuel @ 15.7 litres per hour. MTOW 544kgs. Cruises 85kts@4,800 Rpm. Climbs at 1000 fpm at mtow. Engine hours 270. Airframe hours 1350
PRICE **$37500**
CONTACT **GEOFF SHEATHER 0439 131 313**

6" TRELLEBORG T510 10 PLY TYRES

TRELLEBORG T510, 10 ply tyre (tube type) $99 ea (+p&h) Replaces 13x5.00-6. 3 x tyre life with less flats compared to 6 ply tyre. Fits mains and nose on J160 J170 J230. Spats OK. Postage via Austpost.
PRICE **$99**
CONTACT **JACK@TOPFUN.NET.AU**

EUROFOX 3K

Eurfox 3k, factory built. Ideal for flying school, hangared and covered, all fuel hoses fitted with firesleeves, new fuel lines, upgraded fuel pump, carby diaphrams and rubbers. Engine hours 201 Airframe hours 201
PRICE **$78500**
CONTACT **ROBERT S RIDLEY 0415 888 692**

AIRCRAFT FOR SALE

Aeroprakt Foxbat A-22LS. Metal sides, Tundra Tyres. Can be delivered. Engine Hours 450. Airframe hours 450.
PRICE **$78.000**
CONTACT **BILL HAYNES 0429 054 205**

ROTAX 912 ENGINE ELECTRICAL REGULATOR/ RECTIFIER NEW

Surplus to requirements so is up for sale. $160 for regulator. Includes deliver Aust wide. $200 for Regulator & capacitor. Delivery as above. Paypal/ bank transfer ok. TEXT 0409 835 192.
PRICE **$160**
CONTACT **RHETT MITCHELL 0409 835 192**

PIPISTREL VIRUS FUSELAGE

Pipistrel Virus fuselage complete (no wings or tailplane) including Rotax 912 UL, Pipistrel Vario prop, XCOM VHF / intercom, Dynon D10A, Garmin GPSMap 295, Microair TXPDR, Brauniger AlphaMFD, BRS (requires repack). Airframe and engine only 515 TTIS.
PRICE **$21500**
CONTACT **PHILIP ALLEN 0417 0400 52**

FOR SALE JABIRU J230

Engine hours 300. Airframe nil
PRICE **$35,000**
CONTACT **GRAHAM BARRINGTON 0400 144 282**

JABIRU J160-C

Jabiru J160-C 1500hrs airframe and engine.
PRICE **$45000**
CONTACT **CHAD SUMMERS 0405 339 858**

SONEX 3300

Sonex taildragger, 3300 jabiru, sensenich prop, MGL velocity avionics, engine management & radio. May be able to arrange delivery. Engine time 5 hours. Total time 5 hours.
PRICE **$45000**
CONTACT **TONY MESSENGER 0400 610 076**

SAVANNAH VG

Savannah VG, excellent condition, low hours, always hangar'd.Enging hours 62. Airframe hours 62. (12m x 12m hangar also for sale, $40,000)
PRICE **$60,000**
CONTACT **ERIN JAMES POTTER 0427 042 350**

SONEX 3300

Sonex with Jabiru 3300 for sale by builder, 238hrs engine and airframe. Winner of RAAus Best Kit / Amateur built at Ozkosh Narromine 2016. Removable longe range tank 32L. Always hangered, first flown 2010.
PRICE **$53,000**
CONTACT **STEVEN WOODHAM 0434 727 152**

AIRBORNE STREAK 3 WING ONLY

Used Airborne Streak 3 Wing only for sale. Approx 300 hours. Sail tested, up to specs. White top sale, blue with red trim under sail. Good Condition. Never pulled down, always hangered.
PRICE **$3,000**
CONTACT **BOB THIEMANN 07 5481 2025 / 0418 776 116**

HOLBROOK AIRPORT BEST BLOCK

22 Airpark Road Holbrook NSW 2644. 25m wide 30m deep Vacant Block. Properties of this nature are extremely rare in Australian. $89,000 ono Don. 0417 696461 Email: heliline@fastmail.fm Web: holbrook.simdif.com.
PRICE **$89,000**
CONTACT **DON WOODWARD 0417 696 461**

SKYFOX GAZELLE

Skyfox Gazelle three axis light sports aircraft, reg RA-AUS 24-4090 Rotax 912 T/ time engine, airframe 980 hours. Fitted with radio and intercom. Garmin 500 GPS.A delight to learn in and fly, Can be purchased with custom built trailer. 0407692299
PRICE **$32,500**
CONTACT **JOHN SMITH 08 8735 7115**

JABIRU FOR SALE

Jabiru UL500 2200cc Solid lifter LCH conversion A

reliable, delightful, simple, no vices aircraft. Long wings with winglets provide stability, reduced take off, approach and stall speeds. Call for a detailed data sheet. Engine time 674 hours Airframe time 674 hours.
PRICE **$40,000**
CONTACT **DANIEL COSGRIFF 0468 931 895**

AIR CREATION TANARG 912ES

Tanarg 912ES 100hp. One of todays best weight shift touring aircraft. Always hangared at YMFD and maintained to the highest level at YFT Yarrawonga. Full documentation which includes journey log, flight manual and maintenance reports and releases. Bionix13 wing with 220hrs. Engine time 308. Airframe time 308. Contact anytime.
PRICE **$59,000**
CONTACT **MARTIN ALAN RICHMOND 0458 110 932**

MORGAN CHEETAH

Morgan Cheetah, Camit 2200 engine, 55 hours on the motor, 350 airframe, no accidents, 115 KTS cruise, Black.
PRICE **$38,500**
CONTACT **JOHN TERENCE MURPHY 0409 308 232**

AERONCA CHAMP 7ACA

Champ 7ACA Sport aircraft for sale. Engine time 480 hours. Airframe time 30 hours.
PRICE **$48,000**
CONTACT **DALE WEBER 0417 702 157**

AIRBORNE XT912 TUNDRA ARROW MICROLIGHT

Trike & wing in excellent condition. Kept in darkened hangar. Trike TT 313 hrs. Arrow S wing TT just 40 hrs. Flies perfectly, all maintenance recorded. Two yrs rego. 912 freshly rehosed. Meticulously cared for. Trike trailer loan by arrangement.
PRICE **$32,000**
CONTACT **ROB STEWART 0438 394 174**

JABIRU J 250

Eng A33-582 solid lifter never used for training.Trigg TT21 mode S Txp,Garmin Aera 500 GPS, Microair Radio, VGs , Great Touring A/C. Engine time 296 hours. Airframe time 296 hours.
PRICE **$65,000**
CONTACT **IAN WILLIAM BERRY 0427 997 441**

X-AIR HANUMAN

TTIS 200hrs. Factory built (can be but never has been used for training.) 80hp Rotax 912, 80ltr fuel tank 15lts / hr MTOW 540kgs 75kt cruise STOL. Quick folding wings for storage 2 headsets with column mounted PTT. Dash mounted Garmin 495 GPS. Always hangared a treat to fly ideal 1st aircraft.
PRICE **$43,000**
CONTACT **ROY ELLIS**

AEROPUP 19-5206 TAIL DRAGGER X2 SEATER TANDEM

Aeropup Tail Dragger 475Hrs TT, Jabiru 2200 85hp 475hrs TT (a good one), folding wings, see WWW. aeropup.com , can be registered GA, Stits covered, XCom radio, Miser fuel flow meter, registered trailer, Strobes, wigwags, electric flap, tundra tyres.
PRICE **$36,000**
CONTACT **TONY PETER LOEFFEL 0432 341 681**

AIRCRAFT 19-3788

Rand Kar. good cond, plenty of life in the oil injected blue head 582 rotax., Engine time 640 hours. Airframe time 300 hours.
PRICE $11,000
CONTACT GREGORY WILLIAM REGAN 0428 585 573

JABIRU SK

Jabiru SK with 2.2 solid lifter motor, complete service history, cabin heater, always hangared, 1000 hour engine rebuild 200 hours ago, 65 lit tank plus 50 lit back up, Garmin GPS AREA 550, new tyres. Flys like a new aircraft. Engine time 1217 hours. Airframe time 1217 hours.
PRICE $29,950
CONTACT JOHN FREDERICK YOUNG 0418 855 235

AIRBORNE XT 912 OUTBACK

Engine time 65 hours. Airframe time 65 hours
PRICE $40,000
CONTACT JOHN ELCOCK 0419 793 877

AEROCHUTE DUAL

Aerochute Dual. Engine time 35 hours. Airframe time 35 hours.
PRICE $17,000
CONTACT ED HERRING 0408 787 018

VANS RV3B

Van's RV3B, Better than new,(done 61 hrs and all good) IO320, Catto FP.
PRICE $95,000
CONTACT PETER PENDERGAST 0418 129 222

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. Engine time 286 hours. Airframe time 626 hours.
PRICE $65,000
CONTACT PETER GILBERT 0428 719 639

ULTRALIGHT AIRCRAFT, DRIFTER 503

Registered as 25-0186, so factory built. Instruments include: ASI, VSI , ALT , Turn coordinator , EGT, CHT, RPM, fuel flow gauge , GPS, radio, ELT. Recent 100 hourly completed. Has had new cables, spark plugs, skins, skid, air filter. all ways hange. Engine time 1 hour. Airframe time nil.
PRICE $13,000
CONTACT LACHLAN MCCABE 0420 422 606

CORBY STARLET 19-7015

Corby Starlet with 2.2 solid lifter Jabiru engine. Fine finned heads. Brent Thompson prop.. Cruise 110kt

@ 2850 rpm. using under 13lph. Climb 1000 + fpm. Engine time 155 hours. Airframe time 155 hours.
PRICE $0
CONTACT COLIN GAMBLE 03 9852 3958

LYCOMING O-360

Lycoming 0-360 for sale, 25hrs since bulk strip and rebuild,complete firewall forward with constant speed full feathering prop Parting out Duchess most other parts available.
PRICE $15,000
CONTACT MICHAEL RIDDLE 0477 000 343

AIRBORNE TRIKE

2012 airborne trike XT582, cruise wing, adjustable trim, 205hrs wing and base. excellent condition. wing never packed. Easy and a pleasure to fly. Skydat digital display, radio, headsets.$25000 email ianholmes3@optusnet.com.au. BRS parachute $2200.
PRICE $25,000
CONTACT IAN HOLMES 0409 156 931

DRIFTER SB582

Low hours (880) and low TO/L (894).
PRICE $24,000
CONTACT RICHARD NOTHARD 0431 914 652

GARMIN 296 / JAB 2200 TIMBER PROP

Garmin 296 GPS, in great condition latest updates done. Gps has done 260 hours, $500.00. Jabiru 2200 timber prop (160D) in excellent condition, done 260 hours, complete with backing plate and spinner $850.00.
PRICE $500
CONTACT CAL 0408 229 211

JABIRU J 230 D

This plane is in excellent condition and performs great. Always parked in a Hangar and well maintained. Has loads of power for short runway take of and landings. Engine time 305 hours. Airframe time 305 hours.
PRICE **$69,000**
CONTACT **BARRY ESPINOS 0428 216 816**

X-AIR F

X-AIR F, rotax 618, brolga 3 blade prop, micro air 760 VHF, partially dismantled. Engine time 365 hours. Airframe time 365 hours.
PRICE **$8,500**
CONTACT **MIKE BRADY 0417 228 671**

JABIRU TAILDRAGGER – 3300

Solid Lifter Engine with fine finned heads, Standard Instruments plus Microair Radio, GTX327 Transponder, Garmin 196 GPS, GT40 Flight Data, Card Compass, Tru Trak Auto Pilot coupled to GPS. Aircraft hangered at YWSL. Total time - A/F & bottom end 650hrs, top end 150hrs.
PRICE **$35,000**
CONTACT **DARYL HOOKE**
DGHOOKE@GMAIL.COM OR 0466 925 474

AIR CREATION TANARG 912 TRIKE

Due to recent medical restrictions i need to sell my very safe and comfortable french made TANARG. Very sad. It has the amazing BIONIX 13 WING with in flight adjustable trim giving you easy short landings and a faster cruise speed. Check out the 'SPORT PILOT' May 2015 issue for the write up and more photos. Please see website for more details. Contact me and I can share more
PRICE **$45,000**
CONTACT **MICHAEL MURPHY 0488 361 236**

BRS-6 1050 CAN BALLISTIC PARACHUTE FOR SALE

BRS-6 1050 CAN Ballistic Parachute for sale! Rocket until 01/2024, Repack is 01/2018. Up to 475kg and 276km/h. Has been on an aircraft that had only 2 test flights (bought brand new). Selling because I'm building a house and don't fly at the moment.
PRICE **$4,900**
CONTACT **JAN ARNS 0490 024 503**

JABIRU LSA .3J

Standard instruments plus vac pump (AH & DG) full condition report available Offers around $30,000.
PRICE **$30,000**
CONTACT **WILLIAM POWELL 0428 727 152**

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John Crosby handing over the trophy to David and Jen Ford from Esperance

WHERE IS CAGIT?

CAGIT LODGED IN THE WEST

DAVID and Jen Ford from Esperance were on the east coast in October for Oz-Kosh in their Brumby 610. Taking their opportunity, they went a little bit further, lifted the Come and Get It Trophy from Glencoe, where it had paused only briefly, took it back to Narromine and then home where it will no doubt bounce around the west coast for a while.

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

ADVERTISERS INDEX

CLARITY ALOFT LINK HEADSET

BY MARTIN CASTILLA

WHEN I started flying lessons I used the school's ubiquitous Dave Clark headsets. They must be good because every school uses them.

Some months ago, with 12 hours of dual lessons in my logbook, I borrowed a set from the school to attend a fly-in with a buddy in his noisy STOL aircraft. Loud as a truck, the entire flight I heard nothing but engine and wind noise, virtually no radio comms or even our pilot-to-pilot talk. The old DCs weren't up to the task in this environment.

I decided to invest in my own set.

My flying instructors swear by BOSE's A20s, but the price in Oz is more than $1,400 for the Bluetooth model. Seems to me every pilot wants a set. They look great: lightweight, hi-tech metals, in-cup mics/speakers, springs, cables, software, technology – they look a million bucks. That description also applies to Lightspeed's top models, and a couple of others I looked at.

I have accurate long range vision but wear glasses for reading, so frequently I swap sun- and reading glasses to read maps or iPad software. On a longer flight, I do a bucketload of glasses swapping. Traditional headsets make this a nuisance. I slide the glasses forward, slip new glasses in, readjust the ear cup and over-the-head bracket, repeat. On a cross country flight when we regularly check navigation software, this swapping happens 10-20 times.

Then I discovered in-ear headsets.

I watched YouTube, read reviews, trawled blogs. People using them often mentioned the glasses swapping issue and how this type of headset solved it. Bam!

Research showed three main options: Quiet Technologies, Clarity Aloft and Faro. Each a different design and spec, with a big price difference.

This article isn't a comparison, because I've not used two of the brands. Research for yourself here: http://www.faroaviation.com/, http://www.quiettechnologies.com/ and https://www.clarityaloft.com/.

A SUMMARY

Both QT and Faro cost less than US$400 and have many fans. The reviews are almost all positive. CAs also receive high praise, but cost double at around US$800 for the 'LINK' Bluetooth version. That's a huge difference.

QT Halos look a bit plasticky, but users highly rate them on performance in all aircraft types. The catch? There were none available. QT website's home page said 'No stock. We're months away from fulfilling current orders, so no waiting list either.' They are either very popular or have a bad supply chain.

Faro AIRs are good looking units and the company has a long history. Unfortunately, when I was searching, I could find only three or four reviews of the in-ear model (there are more on their website today), and I didn't want to risk good money on a product with so few independent reviews. Strike two.

So I bought a Clarity Aloft.

IN ACTION

I chose the Bluetooth option because much of the electrickery in aircraft these days speaks to us – iPad aviation software, smartphones, GPS and nav gear. Everything's heading that way.

I've yet to test the Bluetooth while actually flying, but it worked perfectly while I was in my car. I asked a mate to call me while I drove, and we spoke via the headset as clear as day. Bluetooth works as intended.

And when in the air, the clarity aloft (no pun) is outstanding.

There's no noise to actively suppress because – as the company explains – no noise gets in your ears. The ear plugs seal so effectively the only thing you hear, apart from the aircraft engine rumble which we also feel, are radio comms. Pilot-to-pilot and ATC chatter is clear as (bro). I use only half volume otherwise it's too loud.

I can do the glasses shuffle without a problem, too, because the glasses sit on my ears on top of the gently curved, comfortable lightweight wire unit - problem solved.

I forget I'm wearing the unit because it feels like it weighs nothing. I tend to fidget a bit with the microphone position, but I also did that with the DCs. I must be a fidgeter. And I have read reviews from women who love in-ear headsets because the absence of an over-the-head clamp means no flattened hair or interference with ear jewellery. I have neither of those problems.

PROS & CONS

CON **THE ELEPHANT IN THE ROOM:** I can't help feeling CA made about AUS$700 profit from me on a AUS$1,000 headset – there ain't much to them. But no one forced me to buy them.

CON **THE SCREW-ON EAR TIPS SLIP TOO EASILY OFF THE CABLE.** On two occasions one remained in my ear when I pulled the cable too abruptly. They came out easily enough using my fingernails – but it shouldn't happen. A tip also came off when mucking around with seatbelts – the cable was under the belt, when I pulled, the tip came off and fell on the floor. Hence I always carry a spare tip in my pocket when flying.

PRO **BRILLIANT, CRYSTAL CLEAR SOUND.** I've not experienced the sound quality of top-of-the-line alternative brands, but can't imagine they can be any better.

PRO **IT WEIGHS NOTHING**, there's no pressure on the head or ears, and no sweaty heat build-up. I forget it's on.

PRO **BLUETOOTH OPTION WORKS** (although yet to test in an aircraft), and if not being used, i.e. when flying circuits, the component can be removed to reduce cable clutter.

PRO **A SOLUTION FOR GLASSES-SHUFFLERS.** They also fit under helmets (open cockpit jockeys take note), and won't interfere with hair or jewellery. If you want to move away from entry level quality Dave Clarks, and can justify the cost, the Clarity Aloft product should be on your shopping list.

Local flavour for electric aircraft

let's hope it's not too big for RAAus...

A PERTH based company, Electro.Aero, has been chosen to be the Asia Pacific distributor for the solar-electric Sun Flyer flight trainer.

Electro.Aero, which focuses on commercialising electric aircraft, will also do final assembly and maintenance of the aircraft as well as establish service centers for Sun Flyer aircraft customers in the region.

George Bye, CEO of Aero Electric Aircraft Corp which is developing the aircraft, said, "I would like to thank Joshua Portlock, founder of Electro.Aero, for his vision and interest in electric propulsion for general aviation aircraft."

Joshua Portlock said, "It is quite an honor to be a part of this pioneering project which will revolutionise general aviation. Australia and Asia Pacific is one of the largest growth sectors for pilot training, so we are keen to help advance the transition to environmentally sustainable aviation, through this Sun Flyer distributorship."

Sun Flyer is being developed as the first FAA-certified, U.S.-sponsored, practical, all-electric airplane to serve the flight training and general aviation markets. It features low operating costs, low aircraft unit cost, low noise and the elimination of exhaust pollutants. Energy, or fuel, cost for Sun Flyer is only about $1 of electricity for each hour of flight.

The two-seat proof of concept prototype began power-on tests at its home station at Centennial Airport near Denver in November.

For more information, http://www.sunflyer.com.

but this is the future coming...

...and it won't be long till we get the power

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

Find out more at www.airborne.com.au
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