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RECREATIONAL AVIATION AUSTRALIA / SEPTEMBER 2015 VOL 49 [9]

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The first look at the new Aeroprakt A32
Photo: Foxbat Australia

ON THE COVER

"You can have the proverbial cake and eat it too"

REGULARS

COLUMNISTS

NEWS

READERS' STORIES

BUILD STORY

FEATURES

FLY-INS

VIEWPOINT

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ONE MAGAZINE TWO FORMATS

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Awkward conversations

BY MICHAEL MONCK

Recently I took a week off from my paid job to catch up on my other job with RA-Aus. I travelled to Queensland to meet members and discuss where we have come from, where we are today and where we want to be.

It seems to me most people agree changes are necessary. A big part of this revolves around safety.

We have several roles within the organisation devoted to the subject of safety. Most people would obviously believe our National Safety Manager is to be the most significant of those roles. Some might also argue our Ops and Tech Managers are the most senior. Others would say CFIs play the critical role. And there could even be an argument that our Regional Safety Officers (RSO) are the key people. To a greater or lesser degree all these views are correct. Having said that though, I'd also argue they couldn't be more wrong.

The most important people when it comes to safety is all of us.

During my travels there were always discussions about the responsibilities of each pilot and the roles all of the above official people play. In the position description for RSOs, for example, it states that each of them has been appointed to promote a 'safety culture and conduct hazard assessments'. But isn't that our role? Shouldn't we all be doing that?

In a recent conversation I had with the newly appointed ATSB Commissioner, Chris Manning, we discussed the act of walking downstairs. Every time we do it our minds assess the situation and decide on an approach. Are the stairs wet? Are they steep? Are they in a state of disrepair? And what about us? Are we okay to walk down the stairs? Are we fully functioning - no sprained ankles, crutches or other impediments? What about external influences? Are we carrying shopping or something heavy? Is it dark?

All of these questions contribute to our decision-making process and we ultimately factor it all in to a choice which has us walking down the stairs, either holding onto the handrail or running. On the surface it might seem like a rudimentary example, but it highlights how each of us constantly reviews risk and how we assess hazards. If we get it wrong, we risk stumbling and falling down the stairs, resulting in injury or worse.

In this scenario, there's no one else to blame but ourselves. Even if the stairs are broken, we still make a choice and the consequences fall squarely on our own shoulders, because we accept responsibility.

In the position description for an RSO, there's also part where it says that one of their responsibilities is 'promoting safety awareness and a positive safety culture'. I'm not saying it is not their role to do that. It is actually an incredibly important part of their role. It worries me though, that if we believe safety is their role, we risk falling prey to a common trait in human thinking – cognitive dissonance.

This occurs where thoughts are inconsistent and conflicting. In the case of safety, we all happily state we are responsible for safety and that we should all play a key role - but our actions may not reflect what we say. We overlook a risk or hazard because, in the back of our minds, we believe its someone else's responsibility. It's a common phenomenon but not one which many of us may be consciously aware.

In recent months we have had several fatalities. I sometimes hear a muttered "it was only a matter of time with him" or words to that effect. When pressed, the same thing is always mentioned - that the pilot demonstrated risk taking behaviour before the final flight so it was not surprising the accident had happened. And if you ask why nothing was ever said, it was because the other pilot thought it was not their role.

They believed criticism should have fallen to a CFI, the Ops Manager or someone else to make.

It's time to change that attitude. Safety is my responsibility. It's your responsibility. And it's everyone else's responsibility too.

We need to get comfortable discussing these sorts of things in the open with each other. I'd much rather an uncomfortable conversation about the stupid crosswind landing I did or my failure to stop at a holding point, than have someone talk to my wife about how it had been only a matter of time before I killed myself.

The conversations I've had in the past week or so have been great and I took away a lot of positives from them. But it has also been reinforced by many people more experienced than me that it's my own role as a responsible aviator to speak up when I see something that's not quite right.

We should all take that responsibility a little more seriously and help each other to avoid the really awkward conversations.

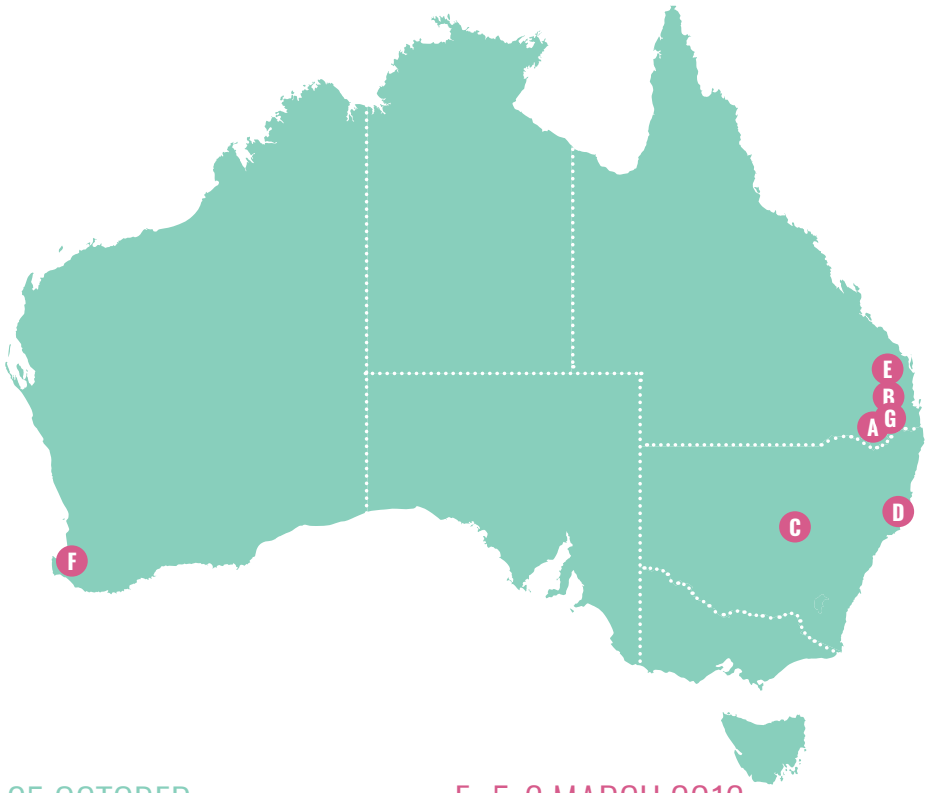
A. 12 SEPTEMBER
WINGS OVER WARWICK

Queensland Recreational Aircraft Assn incorporating Warwick Aero Club (www.qraa.info) invites pilots and enthusiasts to Warwick Aerodrome (YWCK). The strip is 1,600m all bitumen with no landing fees (www.warwickaerodrome.com). Includes model plane display. Food and drink available. For more information, Graham Hawthorne 0427 377 603, Kelvin Hutchinson 0407 733 836 or Phil Goyne 0417 761 584.

B. 3-4 OCTOBER
ARCHER FALLS ANNUAL FLY-IN DRIVE-IN

Come and meet the Fockers. Camping, food and coffee all day. Dinner Saturday night and bar. Adults $10 per day. Camping $5 site fee.Archer Falls and Wings of Life support Youth in Aviation. For more information, Ron 0408 195 497, archerfallsairfield@gmail.com or ronnyrocket @exemail.com.au.

C. 4-6 SEPTEMBER
AUSFLY



D. 23-25 OCTOBER
RATHMINES SPLASHDOWN & CATALINA FESTIVAL

Guest speakers will address marine parks, waterways access, maintenance and corrosion tips. HARS demonstrations.

For more information www.seaplanes.org.au and www.rathminescatalinafestival.com.

E. 10 OCTOBER
RA-AUS 2015 ANNUAL GENERAL MEETING

The meeting will begin at 2.00pm at the Brothers Club, 130 Takalvan Street, Bundaberg.
Following the AGM, members can take part in open discussions with the board and CEO. At 4.00pm discussions will be held about the draft constitution.
For more information www.raa.asn.au.

RECREATIONAL AVIATION AUSTRALIA

F. 5-6 MARCH 2016
AEROFEST

Busselton Aero Club in WA. Big family day with everything aviation, skydiving, food and drink. Saturday evening BBQ. Busselton Regional Airport is the gateway to the Margaret River wine region.

For more information, Ken Manton 0429 967 172 or ken.manton@bigpond.com.

G. 13 MARCH 2016
CLIFTON FLY-IN

This has become an iconic event in the region and is the premier attraction for all types of aviation in southern Queensland. See various types, shapes, sizes and models of recreational, ultralight and homebuilt aircraft. Come late pm Saturday for BBQ and drinks. Fly or drive in, see ERSA. On-field camping, bring your swag. Advise for catering. For more information Trevor Bange 0429 378 370 or (07) 4695 8541 or trevorbange@bigpond.com.

LETTERS TO THE EDITOR

PNG WARNINGS

I write with regard to the excellent article `5 years, 40 deaths,' by the Ops Team (*Sport Pilot* July 2015).

My reason for doing so is to add a caution to any Private or other VFR pilots thinking of touring next door to see the incredible mountain scenery in Papua New Guinea. Please do not venture into the highlands without prior experience or knowledge of the area, because having the best maps and navigation equipment may just delay a serious problem occurring.

An instrument rating and lots of fuel can get you to sea level, but without radar, you could have your wings torn off in a thunderstorm, as has happened there, even at low level. And forget accurate weather forecasts, except for major airports.


5 years, 40 deaths - It's time to talk

For example, I took the Risk Assessment Test (Don't go = 14) as a VFR (but very instrument competent) PNG experienced pilot. I scored over 50. As a chopper pilot, flying routinely for a customer, my score came to 76, normal for routine commercial, year round operations.

For the VFR Pre-flight Test, ignoring crosswind and runway considerations for choppers, my scores were- fixed wing 42 and rotary wing 40 (High Risk = 50).

This is why responsible PNG companies spend a lot of money training single pilot flyers and have a graduation period, from low level to 15,000ft (chopper landing) VFR operations, regardless of prior total flight time or experience elsewhere.

GPS is a help, but very often in the highlands, you just have to know various mountain gaps from memory to stay out of the trees. For routine Charter ops there you just say, "operating, not above 10,000ft" - or often, higher.

If this letter helps prevent just one misadventure up north, it will have been worth my time. More PNG stuff at www.phillatz.com and please keep up the interesting and informative articles in *Sport Pilot*.

PHIL LATZ

CRASHING NUMBERS

In the June 2015 edition of our magazine (sorry just finished it, I have a large reading list) was an article called Risky Business in the Learn to Fly feature. A paragraph in this article caught my attention. It was the idea of two vehicles colliding at 60km/h having the equivalent impact as if they were travelling at 120km/h. While this seems intuitive, it is actually not quite correct. As I was reading that statement, my mind was cast back to an episode of Myth Busters I saw some time ago which dealt with this very idea.

The result blew me away and reset my thinking on the matter. I have included the link for you to have a look at. A line in that episode struck me. To paraphrase it "The car travelling at 50mph does not know that the other car is travelling towards it at speed so the impact damage is as if the car hit a wall at 50mph". The force of the collision of 100mph is shared between the two vehicles so each gets 50mph damage. It does mess with your head a bit.

http://scienceblogs.com/gregladen/2012/10/01/mythbusters-onhead-on-collisions/

ANTHONY COLEIRO

IT HURTS MORE

Just wanted to drop you a note of thanks for your 'Editor's Choice' article in *Sport Pilot*

('It hurts when it's over' July 2015).

I'm reading *Sport Pilot* on my iPad on a jet headed for Townsville and hoping the people around me aren't noticing the tears in my eyes.

Hopefully the end of our flying days is many years off for both of us. But it will come and it will be hard - I'm having enough trouble coping with being grounded three or four weeks because my plane's down for maintenance.

I saw a guy at my home field go through the same thing a while back. He'd come out to the field most Saturday mornings, get his plane out (which he'd owned for over 40 years), check it over, attend to any maintenance items, then he'd get in, start it, warm it up, taxi to the threshold, do the run up, sit there for a minute or two then taxi back to the hangar and put it away. It was sad to see - although it was also good to see him make the right decision (not to fly) because he really didn't look like he was up to being at the controls in the air.


It hurts when it's over

A hangar mate said to me one day, "so-and-so's problem is that he doesn't have another hobby". I think that's true of so many of us. Aviation can be an all consuming passion and when it ends, which it will for all of us and sometimes well before we're ready, we can be left high and dry. Might have to get back into sailing.

TONY KING

ONGOING SAGA

My first instinct when I discovered my flying magazine was to be done away with, was ... this isn't right.

After doing some research and a little bit of detective work I'm now sure of it. Let me explain why.

On May 19, I penned a Letter to the Editor. In this letter I expressed my disappointment at the prospect of either having to go without my much loved magazine or pay extra.

It had been my intention to go to my local newsagents to buy a copy of the magazine which contained my missive, but guess what? They no longer stock it. I live in Toowoomba and I went to the two major shopping complexes and neither of the newsagents there stocked my mag. Hmm?

I must confess, I did go online and found a copy of the mag (with my letter). The thing I found most interesting, was the amount of feedback (generally negative) about the change to digital. It was while I was reading all these letters that the truth started to appear by way of replies from the CEO and Editor.

From the information they provided, I was able to find, firstly an online copy of the RA-Aus Financial Statement, and also (from comments by the Editor) a better understanding of the costing associated with the production of our mag.

Let's look firstly at the running of the RA-Aus. In a nutshell, the role of RA-Aus is as follows.

1.To ensure our aircraft meet certain criteria to be registered with our organisation;

2.That these aircraft are registered and maintained correctly;

3.That pilots are approved and endorsed to fly them;

4.And we are kept informed of the happenings of our organisation and relevant technical and safety issues...ie. a magazine.

For these privileges we pay a nominal sum. If you look at our hopelessly outdated website, it says that the fees will go up in January 2014 to $210.00 (2014)!

Coincidentally, I just received my renewal. Sadly, at the moment I am a Non-flying Member and, as such, have to pay $90.91 + GST of $9.09 = $ 100.00 neat.

I split the bill up for a reason. We have been told that if we wish to keep receiving the printed magazine, we have to pay $90 extra per year. That's a 100% increase from last year. What the? So what did my first $90 go to? Now you want me to pay $180 a year for 11 mags I've calculated cost $2.51 each to produce. Ok so there's postage on top. You're still making a hefty profit from me.

For those of you lucky enough to be committing the heinous act of aviation at the moment (I hate you all) you will be paying around $210.00 a year.

Now if you wish to keep receiving your printed mag, your membership fees just went up to around $300.00 or by around 43%.

The other issue I noted to be well out of date on the website, was the Profit & Loss Statements. The last one listed was May 2014. It went on to say that from then onwards, they would be posted quarterly. Yep you guessed it, none. 14 months' worth missing.

When you look at the actual costs (provided by the Editor) it doesn't take long to realise there is a huge amount of wastage annually from unsold mags. If production was reduced to just members (plus a few for libraries, museums, back issues etc.) suddenly the whole exercise becomes a lot more tenable. After all, isn't this what I'm paying $100.00 a year for? To be kept informed of my organisation? As long as I'm not flying, why bother remaining a member of RA-Aus? Why not just go out and buy the mag and be done with it?

As I scanned through all the other Australian aviation magazines that were available to buy on my newsagent racks, the thought also dawned on me, we can still advertise our organisation through these other magazines.

We don't need to produce a mag to sell, rather sell our organisation to interested parties through advertising and hopefully they'll join and receive a free mag?

Finally I'd like to point out that this is an organisation. It is not a (for profit) company. With cash reserves in excess of $1 million, I think we can afford to carry some loss until a more favourable outcome for the members, or a more holistic management, can be found.

DIETER HITCHINS

FROM THE ED*/The magazine was withdrawn from newsagents almost two years ago because few people were buying it. The CEO and I are in discussions about bringing Sport Pilot back for general sale once the changeover to digital is finalised. The thought is perhaps to concentrate our efforts in the big airports, where we know there are people interested in aviation. The problem is that these newsagents require you pay them a minimum of $1,500 each per month for the privilege of carrying your magazine on their shelves. Multiply that by the seven big airports and you have to sell a bucket load of magazines to break even.*

SEEING THINGS

I am a 64 year old microlight pilot. When living in the UK I travelled from Kent to the Lake District in Cumbria near Scotland. I trailered my microlight, a Thruster T 300, behind my ute the 300 miles. The Lake District has five main lakes of beauty, Coniston being the biggest. We stayed at a house in Shape, owned by Lord Loughter, at 1,100ft above sea level.

Taking off on the only grass strip on his land was an amazing experience. 30 seconds after take-off you are over the M6 motorway and 1,000ft above that motorway.

The Lake District is the playground for the RAF. They practice low flying around the lakes. For this reason, if you wish to fly anywhere in the area you must ring and speak to the RAF duty officer and get a briefing on their flying activities for that day.

It was a Wednesday and I was informed there would be no RAF planes conducting exercises in the Lakes area. I took off at 10am, on a cold frosty morning, with a friend and pilot in the passenger seat. 15 minutes later we were circling Lake Coniston at 1,000ft agl.

Looking down I suddenly saw four Harrier jump jets, in formation, flying under me. They banked and climbed shooting skyward into the blue yonder like it was their playground and we should get the hell out of there. We obliged and we're back on the ground within 15 minutes. No radio contact was made by them to us and when I hurriedly rang the duty officer again (quoting my reference number) I was told "you are mistaken, they could not have been there".

The moral here is look, look and look again. Pity I did not carry a camera. We had three more uninterrupted days of flying before it really snowed and it was time to drive home.

I now fly an Ali Pioneer 200. It's a great little machine.

PETER STEERS

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).

WASP PROBLEMS

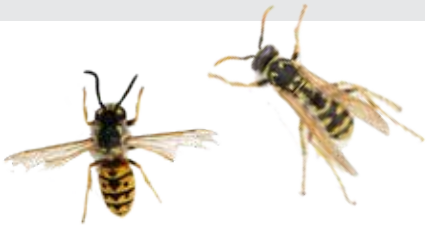
CASA has warned pilots, aircraft operators and maintainers to be on the lookout for wasps. Mud dauber wasps can remain undetected in an aircraft structure, flight controls, drains and pitot static systems.

A nest can completely block tubes, fuel tank vents and drains (a pitot tube can be blocked in less than two hours).

Mud dauber wasps will build a nest in any available cavity, typically in corners and on flat surfaces. CASA says a recent service difficulty report revealed wasp nests inside the wing of an aircraft, in the cavity formed between the rear spar and the flap fairing, as well as in the rear fuselage, including one large wasp nest entirely suspended on flight control cables.

In an airworthiness bulletin on the subject, CASA makes three recommendations. It recommends aircraft owners consider fitting approved fuel vent screens or removable drain/vent covers, engine compartment blanks and tight fitting pitot/static vent covers. If an aircraft has been stored in the open air for a long time, remove the inspection panels to look into unsealed wing and fuselage cavities before flight.

Wasp nesting sites should be monitored and removed from the general area where aircraft are stored or maintained.



PUT THE AGM IN YOUR DIARY

ALL members of RA-Aus in Queensland should make a note in the diary about the 2015 AGM.

It will held on October 10, beginning at 2 PM at the Brothers Club, 130 Takalvan Street, Bundaberg.

The formal meeting will take about one hour. Afterwards there will be an open forum for questions to the CEO and the board. At 4 PM there will also be a discussion about the new draft constitution.

CLOSING TIME FOR L1 TRIAL

THE three month trial of the L1 Maintainer Authority Training and Assessment package is about to end. The package is available online.

It consists of a Study Guide, which can be downloaded. It will lead you through a series of questions and answers designed to provide you with a sound understanding of the privileges and responsibilities as an L1 maintenance authority holder. There is also a range of reference materials provided by way of links.

When you feel confident about your ability to answer questions about maintaining your aircraft, you can sit the online assessment. It is an open book, 50 question, multiple-choice exam with a time allowance of 3 hours 30 minutes requiring a result of 40/50 to achieve a pass.

When the trial is finished, the success of the L1 training package will be reviewed. As well as analysing the assessment results, feedback from people completing the package will be reviewed to find out what worked and what could be improved. So it is vital you fill out and submit the online feedback form.

You can find the L1 Training link under Technical on the website.

SHARK PATROLS

The recent spate of shark attacks and sightings along the east coast has prompted calls for the resumption of daily aerial shark patrols.

The patrols used to be a regular feature of coastal life in the 70's and 80's but fell out of favour because of the costs.

However, following three shark attacks on Ballina beaches in as many months, and the regular closure of the town's beaches due to shark sightings, the local shire council has decided to explore a new warning system, which may involve aerial patrols.

Ballina Aero Club has been asked to contribute to the plan. Until it is finalised and funded, pilots flying in the area have been asked to report shark sightings by ringing 000 as soon as possible. Their reports to include the location and time of sighting, distance of the shark offshore, direction of its travel and whether or not there is immediate or possible danger to swimmers.

The club will also provide the council with how much it would cost to provide daily aerial beach reports to be broadcast on local radio stations.

FIRST ICON SOLD

ICON Aircraft has delivered its first amphibious A5 to a customer at Oshkosh. The much anticipated A5 is a two-seat carbon-fibre aircraft with foldable wings, powered by a 100hp Rotax 912iS engine.

The aircraft has been designed to be spin resistant and comes equipped with a BRS parachute, LED night lighting and Garmin's aera 796 GPS as standard.

The aircraft will cost about USD$250,000. The first production model was bought by the EAA Young Eagles and will be used by that organisation to take children for their first flights to give them exposure and inspire their interest in flying. For more information, visit www.iconaircraft.com.

ROTAX BEEFS UP

FOR aircraft owners and builders who would like more bang for their engine buck, Rotax has announced a bigger, more powerful model is on the way.

The Rotax 915iS will be based on the Rotax 912/914 engine series and supply 135hp.

The company says the new engine will offer more power, the best power-to-weight ratio in its class, full take-off power up to at least 15,000ft and a service ceiling of 23,000ft. "This engine was specifically requested by our customers and opens the way for larger, heavier aircraft, larger gyrocopters and even small helicopters, or simply more performance for current applications," said Thomas Uhr, Vice President BRP-Powertrain.

The Rotax 915iS engine will be a 4-stroke, 4-cylinder turbocharged engine with intercooler and redundant fuel injection system. Production is scheduled for the second half of 2017.

For more information, www.brp.com

GOING STRONG

BY MICHAEL LINKE CEO

HARD to believe it has been three months since *Sport Pilot* became available online as well as in print.

We continue to receive great support from the overwhelming majority of members about the move.

The financial improvements for the organisation cannot be denied. Many members have told us they love the new design too. Its clear *Sport Pilot* continues to be a world class magazine and something RA-Aus can be justifiably proud of.

Since we began offering subscriptions in July more than 1,400 members have taken up the exclusive membership offer of six free editions if they subscribe for 12 or 24 months.

For members, simply log into your account on the website and follow the prompts. Non-members can download a form or call the office.

The digital copy is also proving to be very popular. *Sport Pilot* on the ISSUU website is viewed by 10,000 people from all over the world each month.

Don't forget there is also a low res version on the website if your internet access is stuck in the dial up age.

Sport Pilot remains the voice of Recreational Aviation Australia and the best magazine in the sport aviation sector.

Sport Pilot is going strong.

More progress for Jabiru

BY BRIAN BIGG

CASA and Jabiru have been working together to resolve the issues which have seen operational limitations placed on the iconic Australian aircraft.

CASA introduced what it called precautionary operational limitations on some Jabiru aircraft last December, until the causes of power related problems could be identified and fixed.

In August, two CASA representatives went to the factory in Bundaberg at Jabiru's invitation to witness the tear down of an engine. Jabiru wanted to show CASA that the modifications it had made to its engines should allay the regulator's fears about their airworthiness.

CASA agreed to the inspection on the proviso the engine to be tested had each of the three modifications currently at the centre of the problems (the new roller cam, the 7/16" through-bolt configuration and valve clearances as per the manuals and current specifications).

The engine must also have had no other potentially compromising modifications, Jabiru must be able to verify the maintenance and operational history of the aircraft and the aircraft had to have been operating for at least 200 hours after the three modifications had been made.

According to Jabiru's business manager, Sue Woods, the engine brought in for tear down was being used in a busy flying school Jabiru J170. It had clocked up 950hrs and averaged four landings an hour during that time.

The engine had been installed in July, 2013 with the three modifications included. The engine it had been well maintained with detailed documentation of the maintenance and flight records.

According to Sue, the teardown showed the engine was within wear limits and could have been returned to service with just a top end overhaul at the 1,000 hour service interval for another 1,000 hours.

She says "At our last meeting with CASA, RA-Aus and SAAA in June, it was agreed CASA would consider lifting some or all of the limitations based on the tear down of the engine. Jabiru emphasised that limitations needed to be lifted on legacy engines as well, once they are made compliant with maintenance and operational requirements."

Jabiru is now waiting for CASA's decision.

In the meantime the limitations do remain in force, other than the one change made in July.

Previously the requirement was that a pilot-in-command of a Jabiru-powered aircraft could only carry a passenger if he or she had signed a waiver not more than 28 days before a flight. That was amended to permit statements to be signed not more than three calendar months before the flight. This applies even if the passenger is a Pilot Certificate holder.

"If in doubt ask ATC for airspace status"

Watch those boundaries

BY THE OPS DEPARTMENT

A shadow has been cast over the hugely popular Clifton fly-in in Queensland. Air Traffic Control has reported to RA-Aus that during the weekend of the fly-in in March there were 20 incursions into the active restricted military airspace around Amberley, which lies close to the Clifton airstrip.

According to ATC, each of the aircraft (both RA-Aus and GA) had been contacted on the correct frequencies, however only one aircraft responded.

The radar confirmed each of the aircraft had either headed towards or departed from Clifton. ATC contacted the event organisers and requested announcements be made to inform pilots that the airspace was active. ATC says as soon as the announcement was made, the incursions ceased.

While the activation of Amberley airspace was unusual for a Sunday, it had been listed as having been activated for training flights.

The incursions highlight the need for all pilots to conduct appropriate flight planning, particularly regarding confirming the status of Restricted airspace.

Previous articles in *Sport Pilot* have advised pilots of the places to go for pre-flight planning information, including NOTAMs. The NAIPS system provides a very simple and visual Restricted Area (traffic light system) briefing. Access to NAIPS is free and simply requires a log-in registration to access.

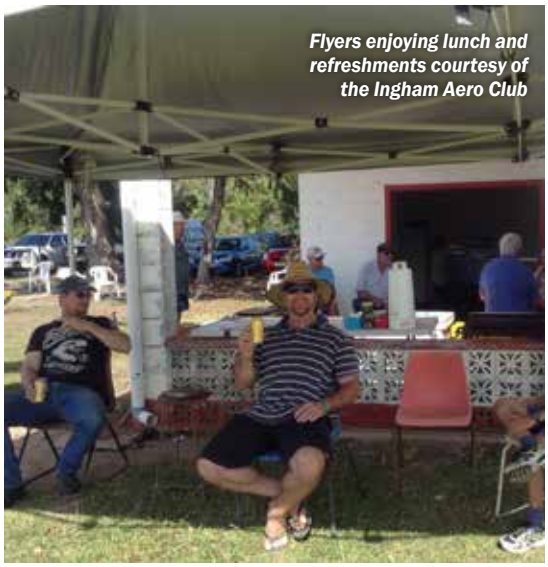
Some simple tips for pilots to build into pre-flight habits are:

- Always get an area briefing including NOTAMS when flying away from your home area or if in close proximity to any Restricted or CTA, even if you regularly fly in the area;
- Plan flights to stay clear of all restricted airspace wherever possible;
- Make sure you navigate visually via easily identified landmarks to confirm your exact position over the ground for all VFR operations;
- Never assume Restricted airspace will be de-active;
- Monitor the appropriate area frequency when transiting near any Restricted or CTA area;
- If in doubt, ask ATC for the airspace status;
- Don't be afraid to talk to ATC. They would rather provide you with clear information than not get any response from you;
- If you need to, ask for help.

RA-Aus continues to work hard to increase privileges, particularly for controlled airspace access, so it is important we all demonstrate good flight discipline, including pre-flight planning. Everyone knows the five P principle - Prior Planning Prevents Poor Performance.

There's another one you should think about - Professionalism.

Clifton 2015. Note the aircraft shown in all these photos are for illustration and are not necessarily aircraft which breached


Flyers enjoying lunch and refreshments courtesy of the Ingham Aero Club

Steve and Mary O'Donnell CFI from Townsville


Aerial shot of Ingham's Italian Festival

Ingham goes casual

BY ROSS MILLARD

The Inaugural Ingham North Queensland Casual Fly-In in July was very well attended.Around 25 aircraft visited. Some pilots and families took the opportunity to visit the nearby internationally renowned Australian Italian festival. Other chose to stay at the airfield and catch up with fellow pilots in the sunny and warm conditions.

The band which played in the Ingham Aero Club hangar Saturday night featuring local pilots on guitars and vocals and me on drums. The Aero Club open-bar provided drinks and food to everyone who enjoyed the evening sitting around two roaring fires.

Several pilots offered rides over the weekend, including a very nice Tiger Moth owned by Graeme Atchinson, who flew up the coast from Ayr to attend.

We look forward to seeing you all again next year from all over North Queensland.


Ingham airport

"Several pilots offered rides over the weekend"

Beach flying at low tide.

The Hinchinbrook channel with Hinchinbrook Island on the right

10 minutes from Ingham airport the large sugar storage sheds at Lucinda with Hinchinbrook Island across the channel

FK9 ELA WB

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The standard FK9 is already 2” wider than the Cessna 172, now in the WB version it easily accommodates larger and taller pilots in 3 way adjustable seating, including seat height adjust. The FK9 design with its rugged integrated load bearing safety frame has been proven for over 25 years and in the FK9 ELA is also available in tri-gear, tail-dragger and floatplane versions.

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Surviving the crash

BY BARNABY WAINFAN **REPRINTED WITH THE KIND PERMISSION OF KITPLANES**

No matter how thorough a designer is, and no matter how careful and skilful the pilot, sometimes airplanes and the ground meet under less than ideal circumstances.

Once a mishap is inevitable, our focus changes from how to prevent a mishap to how to ensure the people aboard the airplane will come through the experience in good enough condition to be upset about the incident afterwards. There is much the designer can do to help keep the unwilling participants in an airplane accident alive. With careful design, many of the factors which lead to injuries and fatalities can be eliminated, or made much less severe.

WHAT DOES THE DAMAGE?

There are several factors which cause most of the injury to occupants in a crash. The most important of these are:

DECELERATION

The human body can only tolerate so many G's before damage is done to internal organs. The critical G-load is dependent on the way the body is supported, the G onset rate, and the duration of the high load. The inertial forces on the airplane structure and components during the crash deceleration are what cause structural breakup of the airplane.

CRUSHING

Occupants of an airplane may be crushed if the cabin structure collapses under load, or if a large object intrudes into the cabin. Crushing may occur longitudinally, due to impact loads, or vertically in the case of a roll-over.

IMPACT

Impact may result from either the people hitting some part of the airplane, or free-flying objects hitting the people.

SHARP EDGES AND POINTS

Sharp objects which are placed so the occupants of the cabin can all hit them during an accident can cause severe injury, even if the crash deceleration is survivable or gentle enough so a simple impact injury would be survivable. The same holds true for sharp objects which may fly freely in the cabin during a crash.

FIRE

It is quite common for the occupants of an airplane to survive the impact, but end up either unconscious or otherwise incapacitated, so they cannot get out of the wreckage quickly. Post-crash fires kill and injure many people who survive the impact and are alive and in a condition from which recovery is possible when the airplane comes to rest.

DESIGNING FOR SURVIVABILITY

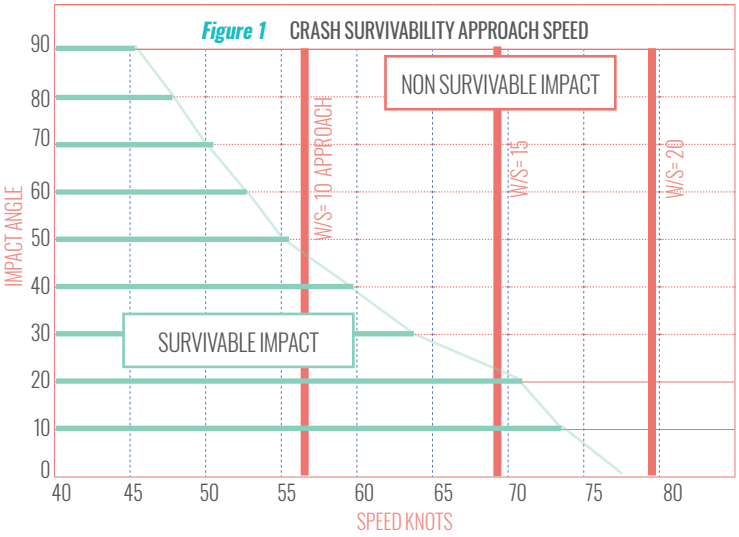
The designer's task is to reduce to a minimum the likelihood of any or all of the morbid events just discussed.

IMPACT LOADS

The most effective way to reduce the chances of injury to the occupants of an airplane in a crash is to reduce the loads generated by the impact between the airplane and the ground or obstacles.

Two factors determine the level of deceleration, and hence impact loading: speed at the time of impact and stopping distance. To minimise load, we want to hit as slowly as possible and take as long a distance as possible to stop.

Figure 1 shows crash survivability as a function of crash speed and impact angle. The data which went into this plot was derived from statistical analysis of a large number of real light aircraft accidents. If the combination of angle and speed falls below the curve, in the area marked 'survivable impact', the crash is likely to be survivable. This does not mean the occupants will be uninjured, it simply means they will probably survive the accident and be in good enough condition so they will eventually recover with proper medical attention. If the impact conditions lie above the line, in the area marked 'non-survivable impact', the occupants of the aircraft are in deep trouble.



If you look first at the effect of impact angle you can see that the steeper the impact, the more serious it is. Note how much the increase in impact angle between 10 and 30 degrees decreases the survivable impact speed. This is not surprising. If the airplane hits the ground at a shallow angle, it is likely to slide some distance before stopping. The slide increases stopping distance and decreases deceleration. As the impact gets steeper, the airplane becomes more likely to simply dig in and stop. At the steeper angles, the stopping distance of the seats and occupants is determined primarily by the crush space available in the structure ahead of the cabin. Deceleration rises dramatically for any given impact speed, with the attendant unpleasant consequences.

The effect of impact angle on the forces in a crash is one of the things which makes stall/spin accidents so deadly. Even though the airplane is likely to hit the ground at a relatively low speed, the impact angle is steep because most airplanes spin in a very nose-down attitude. It is also why flying into hillsides is not recommended.

If you look at the effect of speed on survivability you can see that the faster you hit, the shallower the angle must be if you are to survive. In an uncontrolled arrival on the ground at anything over about 77kts, survival is doubtful. This may seem like a relatively low speed because we think in terms of cruise speed. But remember after touch down, the airplane becomes a ground vehicle. A 77kt, completely flat, but uncontrolled impact with the ground in an airplane is equivalent to running off the road in your car, with the steering and brakes disabled, at just over 140kmph.

Looking at the effects of speed on the survivability envelope, we can also begin to understand the reason for some of the stall speed requirements in the certification regulations. 45kts is the stall speed threshold for very light aircraft. Note this is the speed at which almost all impact angles begin to be survivable.

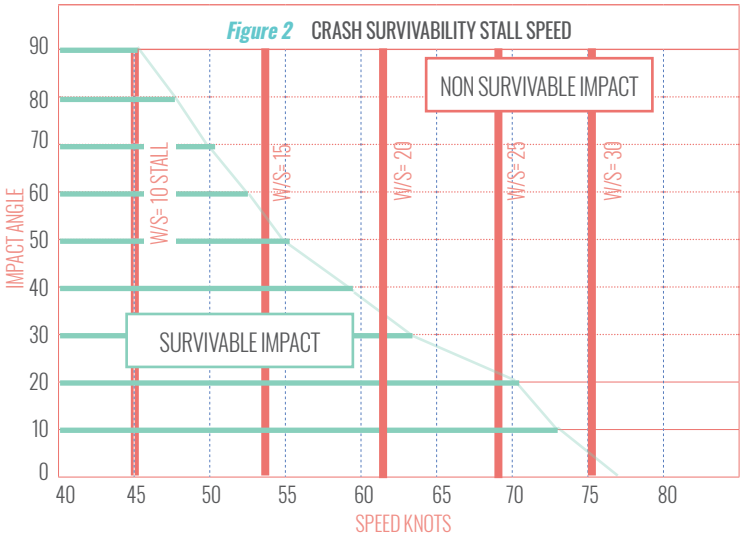
At much below 40kts, almost any impact is survivable if the occupant is restrained in an enclosed cabin. I can personally attest to the fact it is possible to hit a fence at 30kts and walk away uninjured.

The FAR part 23 maximum stall speed for single-engined airplanes is 61kts. Note here, that the threshold impact angle for survivability at this speed is just over 30 degrees. If the pilot remains in control of the airplane, an impact angle of less than 30 degrees is almost assured in all but the most rugged terrain. The goal of both stall speed requirements is to ensure survivability in the event of a forced landing due to failure of the engine.

Now turn your attention to the vertical lines superimposed on the survivability curve in Fig. 1. Each one of these lines represents the normal approach speed (1.3 x stall speed) for an airplane with the wing loading specified next to the line, and a CL^{Max} of 1.6. At a wing loading of 10 pounds per square foot, the approach speed is a little over 55kts. At this speed, as long as the airplane is under control, survival is likely, since the impact angle must exceed 45 degrees to get into the non-survivable zone. At a wing loading of 15 pounds per square foot, the situation is a little dicier. As long as the impact is flat, the odds of survival are good, but the critical impact angle has dropped to about 20 degrees, which means an obstacle like a hill or a ditch can easily increase the impact angle to a dangerous level. Above 15 pounds per square foot, the situation gets worse fast. By 20 pounds per square foot, a forced landing had better be a controlled landing on a relatively smooth surface if the occupants of the airplane are to have a good chance of surviving.

Good pilot technique can improve the situation slightly. Figure 2 shows the same survivability envelope with stall speeds rather than approach speeds superimposed. A pilot who can flare accurately and touch down very close to stall speed in an emergency can reduce the severity of impact and increase the likelihood of survival.

As we can see from Figure 2, a wing loading of about 30 pounds per square foot will mean even touching down at exactly stall speed will not place a flat impact within the survivable envelope if the impact is uncontrolled rather than a smooth landing on a smooth surface.



What the survivability envelope tells us is that the most effective things a designer can do to improve the crash safety of an airplane are to keep the wing loading down, the stall speed as low as reasonably possible and to make sure the aircraft is easy to keep under control in an emergency. The occupants of a low wing loading, low stall speed airplane have a reasonably good chance of surviving a forced landing. The occupants of a high wing loading, high stall speed airplane are essentially dependent on the availability of a smooth landing site for survival.

NEXT MONTH

Crushing: Once all the loud noises stop, it is essential the people inside the

LEARN TO FLY

Follow the dream

BY JACKIE MILROY

Whether it's been your life-long ambition or a recent career decision, recreational aviation is a cost effective, readily accessible starting point.

Recreational aircraft are fixed, flex or soft wing powered aircraft which weigh no more than 600kg when fully loaded for take-off – that includes pilot, fuel, baggage and passenger.

To learn to fly you are not required to join a club. There are many centrally and regionally located Flight Training Facilities, which are fully accredited by Recreational Aviation Australia, which is the administrator of all recreational aircraft in Australia.

There is a membership fee. This covers your Student Certificate, a $10 million third party insurance cover, a copy of the association's Operations manual, Technical manual and free access to Sport Pilot magazine.

Not certain if you are going to like it? You can complete three hours training before paying the fee. A free temporary membership is available at the Flight Training Facility.

How do I get started?

Find yourself a school near where you live. These are listed on the RA-Aus website (www.raa.asn.au). You might like to start with what is called a TIF – Trial Introductory Flight. This lesson takes about an hour. It will include a pre-flight theory briefing and the flight itself. In the air, you will be shown how the aircraft systems and controls work. Then you will get to do some of the flying yourself (with the aid of the instructor naturally).

If you decide to go for your Certificate, the time spent on your TIF will become the first entry in your log book and will count towards your total hours. During the lessons you do, you'll continue to build up flying skills and experiences, some of which will include learning to fly straight and level, turning, taking off and landing - as well as how to make clear and concise radio transmissions.

These hours of experience will culminate in one of the most exciting events in your entire life – your first solo – when the instructor will climb out and tell you to go flying by yourself. This unique moment will stay in your memory forever.

Is it all complex theory?

There are a number of theory exams you must pass along your journey so there will be study involved. But your school will help you and your instructor will have information about everything you will need.

You can learn the theory at your own pace while you are flying. There are also ground schools in many locations if you need a more structured environment in which to learn.

Generally, you should try and read the theory relevant to your next flying lesson. This will keep the theory in the front of your mind and prepare you for your next flight.

Stepping up

A question for a lot of people is "Does my Pilot Certificate help me gain a Private Pilot's Licence or Commercial Pilot's Licence?"

Reasons for wanting to learn to fly are as varied and different as people themselves. Some people want to tick off a bucket list entry or satisfy a life-long desire. For others recreational aviation is a much cheaper way of beginning a career in aviation. All of your flying hours count towards a Private Pilot Licence (PPL) and Commercial Pilot's Licence (CPL). It is important these early, formative lessons are learned well.

How do flying lessons work?

Lessons usually take about one hour of flying time. You only pay for the time the engine is running. Each lesson will include a briefing before the flight and usually a short debriefing from your instructor afterwards. So allow 1 ½ - 2 hours for each lesson.

Flying is competency based, so how fast you progress will be up to you. To obtain your Certificate you will be required to complete a minimum of 20 hours dual flying and five hours solo. No two people take the same amount of time to get to solo, although most students find it takes more training than the minimum. Aim for one lesson a week and you'll be off to a flying start.

Who can learn to fly?

The minimum age requirement for obtaining your Pilot Certificate is 15 years. That's right. You can legally fly an aircraft long before you will be allowed to drive a car. How cool is that? There is no maximum age limit, but you need to have a health standard required to hold a driver's licence.

What type of aircraft will I fly?

The range and types of recreational aircraft available in Australia is vast but all aircraft used for training must factory built to stringent specifications. This ensures they are stable, economical, comfortable and reliable. These aircraft range from low performance aircraft which cruise around at 50kts to higher performance aircraft which can cruise up to 130kts. All recreational aircraft are limited to a maximum take-off weight of 600kgs and a maximum of two people on board. All training aircraft have dual controls. Flying is limited to daylight hours and only if the weather is good.

Hours and hours

Another question often asked is "Once I have my Pilot Certificate, is there a minimum number of hours I need to fly each month?" No. But you will need to complete a biennial (every two years) flight review with an instructor. This review will take about an hour and is a way of ensuring your flying standard hasn't deteriorated over time. If you want to take a passenger, you must have completed a minimum of a least three take-offs and landings in the 90 days beforehand. In any event, a wise pilot always flies regularly to ensure his or her skills and knowledge are current.

Then what?

There are always challenging goals and the opportunity to learn more in aviation. After going solo, then getting your Certificate, the next phase is a Cross Country endorsement.

"You"ll never know where it may take you"

This involves a minimum of 11 hours learning about navigation. You will learn map reading, orientation, fuel management and aircraft loading. When you master this, you will be allowed to travel beyond the boundaries of your local training area – you would legally be allowed to fly around the world if you wanted (probably don't try this until you have a little more experience around Australia).

Depending on how far you wish to challenge yourself, additional training and further endorsements are also available. These could include flying an aircraft with a tail-wheel, formation flying, glider towing or float/amphibious plane endorsements.

I have a PPL

If you already have a PPL, CPL or ATPL, you will be required to complete a minimum of five hours of conversion training to fly an RA-Aus registered aircraft, regardless of your previous experience. Some of this time can be conducted as solo time.

Can I hire a plane?

Yes. Once you have your Certificate, aircraft from your training facility will be available for you to hire at a cheaper rate than it was when you had your instructor on board with you. Booking is usually required and your favourite aircraft is always subject to availability. The rate you pay will be based on the hours the engine runs.

Sign me up!

How can you get started?

Contact Recreational Aviation Australia – www.raa.asn.au/schools, email admin@raa.asn.au or phone (02) 6280 4700 – to learn about a Flight Training Facility close to you or one best suited to your needs. Book a Trial Introductory Flight to confirm your commitment and then enjoy the journey. You'll never know where it may take you.

Don't worry be happy

BY GEMMA DILLON

If you've always dreamed of flying and you've finally found the time to make your dream come true, the secret will be not to worry too much about it. The team at RA-Aus will guide you every step of the way. But if you are worried about your first lesson, keep these handy tips in mind and let yourself soar.

1. Don't allow anxiety to take hold

If you wonder why, despite waiting all your life for your first flight lesson, you feel a little anxious, rest assured it is perfectly normal. It might help to take stock of the statistics: flying is very safe compared to road travel, despite the fact that most people don't think twice about taking the wheel for the first time when they are obtaining their driver's licence. Try deep breathing exercises.

These involve taking in a deep breath through the nose as you extend your abdomen and exhaling slowly through your mouth. Deep (or controlled) breathing is an important component of therapy for anxiety and depression, since it immediately causes a rapid heart rate to reduce to normal and lowers levels of stress hormone, cortisol. Try deep breathing every time you feel anxiety rise and just before your first lesson. The moment you actually take hold of the controls for the first time, you will probably feel more safe and secure. All training aircraft have dual controls, so the instructor can take over whenever he or she needs to. If anxiety is a recurrent issue for you consider yoga, an activity proven in numerous studies to be a powerful stress buster.

2. Do some reading on the subject of flying

Not everyone enjoys learning in the moment. Reflective learners, in particular, like to research extensively before attempting any new activity. RA-Aus has all the official material you will need, but check with the person who is going to be your newest best friend, your instructor, about what other books and research might help you. There are hundreds if not thousands of books and studies on every possible element of flying.

3. Review what you learn

You will be taking in lots of new information at every lesson. Ensure it sinks in by taking the time to review at home later.

4. Meet other flyers

When you begin flying, it is especially important to network with people who share your passion. You can learn important information at seminars, workshops, parties etc., which can also help you feel like you are part of a community. You might find that even though you might have begun flying as a hobby, when you become more deeply immersed in the subject, you might be inspired to pursue it as a career.

5. Avoid distractions

When you are receiving instructions on the ground or in the air, make sure distractions are kept to a minimum. Make sure you clearly understand everything your instructor is teaching you. Never be afraid to ask questions. It's a sign of intelligence.

6. Keep to a schedule

If you are keen on chalking up your flight hours, make sure you attend classes consistently, so that you do not forget what you learned last time. By sticking to it and attending class regularly, you develop a realistic goal and time frame for your Certificate. Knowing you are on a schedule also gives you confidence.

7. Set small goals along the way

Don't set your expectations too high to avoid disappointment. Take it one class at a time, enjoying the time on the ground and in the air with your instructor. He or she will know when you are ready to try more complex manoeuvres, so don't try to achieve too much too soon.

8. Pay attention to the instructor's post-flight feedback

Receiving honest feedback is crucial to anyone who wants to fly a plane with ease and artistry. Be keen on finding out about your weaknesses, so you can soon turn them into strengths.

9. Make a list of the things you will need

By all means draft a list of necessary items you wouldn't like to leave at home. The list should include a mobile phone or camera (if you want to capture that first magical moment in the air), snacks and water.

It's important to establish good flying habits from the start. They will deepen as you learn, making sure you develop the correct attitude to aviation. It's unforgiving on sloppy habits so put the correct attitude in place as you head to the airport for the very first time.

And yes, it's good to feel excited about learning to fly. After all, you are about to earn a membership in a very exclusive club. One where a casual lunch can be in the next state, not necessarily the next suburb. Go get 'em tiger.

Further reading

http://www.compareni.com/insurance/health.htm

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Hunting the Vixxen

BY ANDREW MURRAY

In the August edition of *Sport Pilot* we announced the new version of Aeroprakt's popular Foxbat had landed on these shores. Andrew Murray managed to get himself into the pilot seat of the new model to do a review for us.

When the first, grainy pictures of the new Aeroprakt A32 emerged, it was apparent it had a strong family resemblance to the A22LS Foxbat.

Indeed, the differences between the two seemed so superficial it was hard to imagine they were merely more than an effort to make the popular bird (as one observer put it) "look a bit less agricultural".

I am a Foxbat owner myself and I was very interested to see what had been done, especially on the performance and handling. That interest mounted when reports came in that the A32 might go as much as 20kts faster than the A22LS in cruise. Given that it had the same Rotax 912 ULS up front and the same fat wing...well let's be delicate and say I viewed such reports with considerable scepticism. After all, everything is a compromise right? If you want a STOL load-lifter with a roomy cabin, the trade-off is plenty of time to appreciate the passing scenery. Conversely, if you want to slip through the thick lower air at 115kts or more you had better be prepared to be shrink-wrapped into a svelte plastic fantastic or be packing more than 100 horsies. But it turns out that you can have the proverbial cake and eat it too.

I was fortunate to be in Melbourne just after the registration papers ar-

rived for Aeroprakt A32 VH-VBQ. Peter Harlow of Foxbat Australia had flown it from Moorabbin to Tyabb a few days earlier and was good enough to let me have a look. Peter pointed out the differences between the A32 and A22LS which fall mostly fall into two categories - things designed to make it slip through the air more easily and things designed to make it more pleasant for the occupants while slipping through that air. Three years of R&D went into the aerodynamic refinement.

The largest gains came from blending the area of wing root to fuselage, raising the cabin roof/windshield to match the level of the wing top surface and the use of an all-flying stabiliser rather than fixed stabiliser and elevators. Much attention was also paid to cooling drag and the most obvious change under the cowling is the use of mouldings to direct the flow of air from a single, smaller front entry point around the cylinders. One wonders if this arose from recognition that the water-plus-air cooled Rotax did not actually need all the air it was being given.

Apart from the addition of more fairings, there are three changes to the wing: It is 10cm shorter, the supporting strut is also slightly shorter and gone are the blister expansions to the fuel tanks on the upper surface. The latter leads to a reduction in fuel capacity from 112 to 90 litres useable. This might be seen as a necessary compromise but in fact, due to the lower drag, the still-air range of the A32 is little different to that of the A22LS (both will take you about 520nm without reserves and at normal cruise power).

> "You can have the proverbial cake and eat it too"

The A32 is clearly designed for cross-country touring and several small changes in the cabin should improve that experience: The seats are now more easily and more fractionally adjustable. They also tilt forward to provide improved access to the luggage compartment and to the new seat-back map pockets. The wing root storage pockets remain and are supplemented by a couple of new ones on the sides of the panel coaming. The windshield bracing struts are gone, giving an unobstructed view forwards (but also removing a good place to mount the GoPro!).

The A32 currently comes only with a yoke and centre throttle control configuration, which makes sense for a cross-country cruiser since there are more right than left-handed pilots and scribbling on a flight plan is easier with the yoke in the left hand. A Y-stick/side mount throttle option, as available in the A22LS, is reportedly under test.

Hunting the Vixxen cont.

One improvement to the cabin both reduces drag and makes long-distance flying more comfortable: the doors now fit flush to the fuselage and close more firmly due to an improved latch design. This reduces airstream noise quite markedly.

VH-VBQ is fitted with a ballistic chute weighing about 18kg, so with 70 litres in the tanks and the two of us in seats, we were at about 550kg - well within the 600kg MTOW as we taxied out to Tyabb runway 35. Checks done, opening the throttle and lifting the nose wheel straight away into the 5kt northerly, we were airborne inside 70-80 metres. Shortly thereafter the Dynon EFIS showed the IAS at 65kts for the best rate of climb and the VSI nudging 1,000ft/min. Reducing power to 5,200 RPM and level at 3,000ft we turned towards French Island and watched the IAS stabilise at 115kts and the TAS at 120kts.

But if the aeroplane had gained 20kts at the top end simply by dressing up a little, had it also gained it at the bottom end? So it was up to 3,500ft over the island, throttle to idle, one stage of flap (overhead lever down one clunk), two stages of flap (clunk again), hold the nose up until - at 25kts it fell away. The manual says the full flap power off stall occurs at 27kts for MTOW, much the same as the A22LS. So the answer would be no to that question - the range between stall and typical cruise is, astonishingly, near enough to 90kts.

Power up, nose up and back to 5,100 rpm/114kts for some handling exercises. Rolling into a medium turn, I suddenly found it had become a steep turn. The A32 has the same full span flaperons as the A22LS. Since we were pushing air 20kts faster over them, I should have anticipated a higher rate of roll for the same control input. I also found myself leading into the turn with too much rudder. It's hard to be sure from this brief exposure, but the A32 appears to need less rudder than my A22LS to get the nose moving around the arc. Overall though, both coordination and lateral stability are good and maintaining a heading would not be too tiring on a long flight (although it does require regular switching from left to right tanks to keep the fuel load balanced). Pitch stability is also fine with elevator forces somewhat heavier than in the A22LS, again no doubt due to the higher speeds.

Tracking back to Tyabb and positioning for circuit entry provided an opportunity to test speed stability and management - something I rarely have to think about in my aeroplane. It does take longer to lose speed and to settle on the desired speed without some throttle jockeying.

In this respect the A32 is not dissimilar to some GA planes I have flown. Although it may sound odd, in this phase of flight it reminded me a little of a Cessna Cardinal RG.

Flaps can be extended once below 80kts and in the circuit the reference speeds are no different to the Foxbat with two on board: 55kts on base with one stage flap, 50kts down final with one or two stages and 45kts over the fence. The only difference is that the power settings needed to maintain these numbers are a bit lower. The flare and landing were straightforward and I could detect no difference to the A22LS except that the nose is a bit lower on the horizon when the nose wheel touches down.

It is easy to focus on the top-end speeds in the A32 but I don't think I got the whole picture on a calm winter day at Tyabb. It's all very well to figure out how to get that thick wing moving at 115kts but what happens when the air is a bit lumpy? I strongly suspect it would get unpleasant. The safe manoeuvring speed is listed in the manual as 105kts (VNE is 125kts) and, after leaving Tyabb, I asked Peter to tell me what power setting and fuel flow correspond to around 105kts. The answers came the next day in the form of a Dynon screen shot: 4,790 rpm gave an IAS of 105 - 106kts, TAS of 110kts at a density altitude of 3,119ft and with a fuel flow of 16 litres/hour. With full tanks that would equate to a still-air range, without reserves, of 619nm.

I had gone to Tyabb with two questions in my mind: the first was whether the A32 performance would meet expectations - the answer to that was 'no' because it exceeded those expectations: it really is a remarkable achievement on the part of Aeroprakt. The second question in my mind was a slightly disturbing one: would I come away feeling horribly dissatisfied with my Foxbat A22LS?

Happily the answer to that one was also a ‘no’, because for all my flying under 100kts - and that’s most of it - there is really no big difference between the Foxbat and the A32.

I love tootling around between 50 and 90kts, often down low with complete confidence in the low speed handling. The good speed stability of the Foxbat means I don’t need to watch the ASI more than is normally prudent and 90kts is fast enough for the times I do go on a trip. The real value of the extra speed would be on those days when the headwind is blowing at 25kts - that’s a much bigger percentage of 90 than it is of 115.

The A22LS Foxbat and the A32 are different beasts and are aimed at different parts of the market. Aeroprakt will continue to sell and support them both and I’m told they are thinking of calling the A32 the ‘Vixxen’. Despite the continued allusion to foxes – an animal not often popular in the bush - I think it could appeal strongly to farmers and station owners.

It can operate from small strips and would excel at low altitude/low speed survey work, but still cover long distances quickly when needed. It also seems a good fit for flying schools using the Foxbat A22LS as it would provide a natural step up when beginning the NavEx phase of training and/or prior to a move across to GA as part of commercial career path. The fuel cost savings alone would be substantial, especially since the Rotax is quite happy with 95 octane Mogas.

Being a Foxbat owner, my point of reference in this article has been the ways in which the A32 differs from the Foxbat. Upon reflection, I could have said simply “not much” as far as the low speed end of the spectrum is concerned. Both aircraft will land and take-off over 50ft obstacles in less than 250m at MTOW.

Finding a peer aircraft for comparison as a cross-country cruiser is not so easy. With full fuel the A32 can carry a useful load of about 220kgs over 400nm with statutory (60 min) reserves and consume 3.5 hours and less than 70 litres of Mogas doing it. There are other aircraft with such capability on the market but few, I venture to guess, which will land safely in a short paddock at the end of the trip.

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Battling the muck

BY DAFYDD LLEWELLYN

It is a simple fact that an unaided human pilot cannot maintain control of an aircraft, once it starts to turn, without a visual horizon. The lateral / directional stability of most aircraft is such that they will, unless checked, gradually depart into an ever-steepening turn.

However the effect is initially quite slow to develop and a pilot corrects for it unconsciously, provided he has a visual horizon. The aircraft cannot tell the difference between gravity and centrifugal force, any more than a pilot can when he has no visual horizon. Only a gyroscopic instrument can detect a rate of turn reliably under such conditions. The Sperry Artificial Horizon has been with us since 1929 and our current instrument flying rules are still framed around that instrument and its sibling, the turn gyro. This is the reason why Civil Aviation Order 20.18 requires VFR aircraft engaged in aerial work operations to have at least a turn gyro. RA-Aus aircraft are not, of course, used for aerial work and are, in any case, exempted from this via their exemption from CAR 207. But that does not mean you can't fit a turn gyro or its electronic equivalent and learn how to use it.

Many pilots would not be alive now had they not had some gyro instruments in their aircraft. However many lack the necessary training to use them to best effect. Every pilot, in my view, should be given sufficient under-the-hood training to at least understand how difficult it can be to fly an aircraft under instrument conditions, especially if there is turbulence around. This does not qualify you to deliberately enter cloud, however.

I learned to fly back in the 1960's and early on was given a practical demonstration of how to make a turn back decision (intentionally or not, I am still not sure).

However such exposure to marginal weather conditions was prohibited in the training syllabus for private pilots shortly afterwards, so they had to learn it for themselves – and the learning experience was sometimes fatal. Any VFR pilot will, sooner or later, be faced with a turn back decision due to weather – and it is one of the most critical decisions a pilot will face. Why, then, is this ignored in the training syllabus? Also, the decision must rest on a reasonably comprehensive understanding of basic meteorology. When training for our PPL theory, we were given the then current RAAF Manual of Meteorology to study. What do RA-Aus pilots get?

Anywhere along the east coast of Australia, one sees the effects of onshore winds and orographic uplift over the Great Dividing Range and having to traverse such conditions is difficult to avoid.

The basic meteorological effects of such a situation need to be well understood; if you are approaching from the downwind side, and the cloud base is near the hill tops, you can expect very murky conditions right down to ground level once you cross the ridge. This is fundamental - make your turn-around decision before you cross the ridge. This applies to any line of hills, anywhere.

The value of the wing-leveller arises when the turn-back decision is not made when it should be (and it's also useful when you want to look at maps etc). It's not a new idea – Mooney had it in the 1960s and accident statistics thereafter proved it was the most effective single preventative for UFIT accidents in single-engine aeroplanes. What is new, is the introduction of miniature solid-state strap-down turn rate sensors which can perform this function with vastly greater reliability than iron gyros, and the digital computing power to use them.

It is better to give the aeroplane the information, in the form of an autopilot driving an aileron servo, which will function to prevent the aeroplane from turning – or which can be used by the pilot, via a turn-command knob, to turn the aircraft onto a desired heading, without risk of loss of control in the process, rather than providing the information to the pilot, who then has to resist the false information from his sense of balance in order to provide the correct control input to the aeroplane.

The powers-that-be have avoided facing these issues in the belief that it will only encourage pilots to take risks with the weather. That is a head-in-the-sand approach and it has been with us for over half a century. People will and do take risks with the weather.

The traditional approach is that pilots must be fully qualified and in current practice to intentionally fly in IMC, because an autopilot is a complex piece of machinery liable to fail at any time, so the pilot has to be able to take over when it does. Also, he must be capable of flying on limited panel because an AH is also a complex piece of machinery prone to failure. Airlines have at least three AHs in the cockpit, so the pilot can resolve the conflict if one of them fails. Keeping routine maintenance up to three mechanical AHs gets expensive, so one does not find that in private aircraft, even if there is the panel space.

To move forward we have to increase the reliability of affordable autopilots to the point where the probability of a failure causing catastrophic results is extremely remote (in current terms, better than 10^{-7} per flying hour or an autopilot having a failure probability better than 10^{-5} per flying hour), together with a means whereby the pilot does not need constant practice to combat the false inputs from his vestibular system, having a similar level of reliability.

This is a considerable step from a VFR stability augmentation system – yet it is not beyond reasonable bounds, even now. How can we do this without huge costs? Current technology is rapidly providing the answers.

Firstly, a simple wing-leveller autopilot is sufficiently low in cost that it would not be totally unreasonable to use three of them to drive the aileron circuit, in such a way that any single channel malfunction will be out-voted by the remaining two. Of course, this requires a means of identifying when such a conflict occurs, so the pilot is warned. Because the autopilot prevents the rate of turn from becoming too rapid, the potential for pilot disorientation pilot is greatly reduced. This makes it much easier for the pilot to maintain situational awareness. The probability of a failure is tripled, but the system can survive a single failure without endangering the aircraft.

Secondly, virtual reality terrain displays on GPS moving maps can provide the pilot with a means of keeping the aeroplane upright and flying straight which is much easier to use than a conventional AH. For this, it needs an attitude input from an AHARS (Attitude Heading And Reference System). These are now being manufactured in quantity for UAVs and are matchbox size. This is necessary to keep the virtual reality outside world picture aligned with the true horizon, instead of the floor of the aircraft.

This level of technology will allow the pilot to stay in control of the aircraft without conventional instrument flying skills – but won't prevent him from flying into terra firma or an obstacle such as a radio mast. Why? Firstly, because the terrain display from a data base is averaged over a relatively coarse grid – which means sharp features such as the Glass House Mountains (north of Brisbane) appear on such displays as minor bumps in the ground (try looking Mt Coonowrin in QLD using Google Earth in a low angle oblique view).

Secondly, because the GPS map will show you the terrain where it thinks it is – which may not be where it actually is. If the aircraft position comes from an inertial reference system with GPS updating, this possibility will be greatly reduced. Such units are currently available at around $5,000 for a good one, which is about the size of a cigarette packet.

A more cost effective way may be to use a combination of virtual reality and forward-looking infra-red imagery; people are playing with ways to combine these (See http://proceedings.spiedigitallibrary.org/proceeding.aspx?articleid=885397)

Of course, all this depends upon electrical power – which means, if you are serious about this, an engine with two alternators. Engine manufacturers are just starting to wake up to this; the Lycoming IO-390-A2 has dual alternator capability, How long before this trickles down to things on the boundary between recreational and serious private aircraft? Your guess is as good as mine – but it won't happen unless the engine manufacturers see a market for it.

How do you avoid collisions in the muck? Outside controlled airspace, via ADSB – which has to become a whole lot more affordable. There's no valid reason why it shouldn't, but we'll have to wait.

Aspects such as lightning are difficult to protect for in a composite aircraft unless designed in, however they can be largely avoided by having the BOM radar picture overlaid on your moving map – AVPLAN already offers this. It needs a mobile broadband link – all current technology but it doesn't work everywhere yet.

The means are at hand to provide pilots with a safe way to get themselves out of IMC trouble. My guess is it will take about a decade.

Cute little Corella

BY ROB KNIGHT

A good friend of mine, Glenda Faint, is the perfect hostess - smiling, gracious and neat. Who would suspect she is also an aviatrix of some renown? In fact in her hangar at Watts Bridge, sits her very own creation – the one and only Corella.

A pert little single seat taildragger, it's bright, shiny, and white, and designed and built by Glenda herself. It has sat waiting for a while as she recovers from a number of health issues and I believe her efforts and success deserve some publicity. Recently I sat with Glenda and asked her about her creation.

"In the early 1990s I was working as an Anaesthetic Technician and Theatre Nurse at the Mater Mothers Hospital," she says. "I had a Lea Kestrel, which I flew happily, but felt that something a little more upmarket would be better. Replacements abounded but nothing seemed any better than what I had.

"Cecil Lea, the designer of the Kestrel I owned, suggested I build something to the specs I wanted. One of these was to get away from Dacron covering and go to a conventional stits fabric material.

"Building started at Cec's home at Seven Hills, in Brisbane. Initially we sketched my basic outlines on a wooden table top and built the frames accordingly. When the frames were ready, we trailered them to our place in Goodna to continue work on them.

"Bill Whitney helped greatly in my design development. He carried out the various inspections required on the frames prior to covering and also supervised the proof-loading of my wing to +6 and -4 G. My husband, Richard, did most of the test flying and Don Mellow also did some. Don had been a great help during the spray painting of the fabric because his skill level was much higher than mine.

"Few changes emerged from the test flying. A little tweeking perhaps, but the only noteworthy item was that I built a second, heavier, set of undercarriage frames. The machine is short and sits rather nose high so the heavier undercarriage was made shorter to improve the forward visibility on the ground.

"The Corella's logbook totals 320 hours on both the engine and the airframe, mostly mine. The engine runs very well – I put a fan cooled oil injected Rotax 503 DCDI in it and it has worked wonderfully. It always starts easily and runs well. I included a battery and electric start in it. Armstrong starters are not very ladylike.

"I fitted brakes working from a squeeze lever on the stick. I never found it needed individual brakes. I designed it with a generously sized rudder surface so the slipstream gives plenty of steerability. I never fitted a park brake, either, so it needs chocks.

"It certainly swings on take-off. Propeller torque is light because of the lower power and is scarcely noticeable. With the high nose blocking your view, you need to watch for the 'P' factor and gyroscopic forces induced swing. Keeping straight on take-off can keep you busy.

"The Rotax swings the prop anti-clockwise from the cockpit unlike aircraft with conventional engines where the props turn clockwise. This provides right swing on take-off and so requires left right rudder to sort out.

"The design Vy is 52kts so I use 50 to 55kts for comfort. I like to keep the Rotax cool so the extra few knots is not a disadvantage. It needs just a little left rudder to keep the ball centred while climbing and the high nose does require frequent turns to clear the area ahead.

"Level cruise is at any RPM above about 5,400 but there is a sweet spot at 6,200 RPM. Here everything feels right and gives 70 to 75 KIAS.

Corella for sale

Glenda Faint

"It certainly swings on take-off"

This burns about 15 LPH, and, as the wing tanks each hold 45 litres, provides about six hours endurance (nil reserve). I recall flying from Watts Bridge to Moree without refuelling, so it has a good range.

"Rolling with aileron requires rudder to balance. The rudder is not heavy but the nose will wander out of the turn if adverse yaw is not countered. Inappropriate rudder use makes holding the correct nose attitude to maintain height in the turn more difficult because yawing when you are banked changes both the bank attitude and the nose attitude.

"My wing has a Clark Y section with constant chord. I chose this combination with stalling in mind and it worked. In a basic stall she begins a slight buffet just below 40 KIAS and the stick shakes at about 37kts. At the stall onset the nose sags but there is no wing drop. Power-on stalls are the same except the right wing may dip a little. But it's so gentle it's barely discernible. Recovery is instantaneous with forward stick and little height is lost if full power is immediately applied. No, I have never spun it.

"With a lift/drag ratio about 8:1 it's no glider. Its naturally steep glide angle is why I don't need the complexity and weight of flaps. Its best glide speed is 50 to 55kts. I have good controllability in that speed range and I can see over the nose easily. With the large control surfaces I designed, it side-slips extremely well.

"Wheeler landings are easy – there's plenty to see and judge over the nose. However, three point landings are challenging. In the float, the rising nose obscures the runway ahead and judging the hold-off height and keeping straight means looking along the side of the nose. Also, like other tail draggers, rudder is most necessary to keep straight as the speed slows in the landing roll, so your feet work pretty constantly.

"After all the hours we have flown together I'd not want to change anything; what I have is what I wanted – something unique. I wanted a pristine white paint job on super-smooth fabric and the "wet look' insignia 2-pack paint I used is still as bright and wet-looking as it was the day I did it. Probably it's most un-endearing feature is its lack of forward visibility with the tail down, but so what? That's a taildragger characteristic I tolerate to get all the other good features I wanted in my design. For me, she's been perfect.

"However, now I have made a decision that my beloved Corella and I must part. The injuries I sustained in my accident leave me uncertain as to whether I can fly again, and she just sits in the hanger waiting. I need to draw a curtain across this part of my life and get on with it.

"She is currently registered so the new owner will only need to organise a Level 2 inspection and arrange with RA-Aus for the registration changeover. I will also pass over all the build photos and details I took when I built it."

If you want to take the Corella home you can email Glenda at Glenda@auavg.org or call on at 0412 317 753 or (07) 5427 0816.

Instrument panel

Pacific Haven to Port Douglas

BY MARK PEARCE

Sam and Grace Cavallaro are well known identities in Port Douglas. 83 year old Sam still flies his Jabiru powered X-Air each day if the weather is fine - and it almost always is.

I tracked down the cane farmer to arrange access to the tourist town because my partner, Susan, and I needed to make an appearance at a relative's surprise birthday party there. A few phone calls leading up to the departure date convinced me conditions were in order.

We loaded up our Jabiru J200 with full fuel tanks, two empty jerry cans, two folding bikes, enough personal gear for two days and flight gear (charts, three GPS units just to be sure) and a myriad of spares. Good thing we are two skinnies!

Under murky skies we headed north from Pacific Haven on Friday morning after checking the BOM site, ASA and assessing the situation from the ground. After all, the bad weather we could see was heading south and no rain had fallen at recording stations north of Bundy. After getting airborne, it became evident forecasts could be misleading.

We found ourselves tracking around a major storm and being pushed out over the water. While still confident of being able to glide back to shore should the fan up front stop spinning, if the conditions worsened our options heading north would have been severely limited and present an unacceptable risk. But just as I was about to turn around and go home, the clouds finally parted. After passing through some rain, we crossed back onto the coast at Yepoon.

I had only recently re-coated the protective leading edge on the Jabiru wooden prop and inspection later revealed the rain had put the prop back to where it had been before the repair. The storm had been listed as a 'significant rain event' which was an understatement. We were to learn later that a number of people had been swept to their deaths by storm waters in Brisbane later that day.

First stop was Nebo, an airfield listed on the 'Airstrips near Pub and Food' web site –a great resource. However, upon arrival there we discovered the threshold had been displaced over 100m leaving about 550m usable. Still no problem for a fully laden Jab even with a tall tree smack bang on the extended approach centre line.

Back in the air, we scooted over wind farms and around cloud between Mareeba and Tully. It's almost always cloudy around Tully - the town is famous for having Australia's highest annual rainfall.

Cruising over the hills to arrive at the Port Douglas strip presented a view that was exactly as Google Maps had displayed when I prepared my flight plan a week earlier. For the record, the GM tilt view gives a pilot's perspective on approach from any direction, any distance out and at any altitude. Brilliant.

This synthetic view was once only found on glass cockpit displays costing thousands of dollars. Provided you have a reasonably modern graphics card on your computer, this will be turned on automatically together with the upgraded view rotation.

Port Douglas parking area

Pacific Haven to Port Douglas cont.


Burdekin River

Both of these symbols appear in the bottom right corner – (see fig 1) I have a water cooled processor in my computer, but I thought the graphics card was going to need a radiator as well when the temperature readings climbed as it rendered the tilt views. The distance measuring tool indicated the Cavallaro strip was about 550m of grass. Low cane only at each end.

I parked at the eastern end alongside a couple of tourist helicopters. I gave the Jab a quick once over. Small fragments of the damaged propeller protective strip (caused by the light rain) dangled off one blade. However, I could tell the prop was still in balance from the feel of the vibrations, or lack of them, on the instrument panel at cruise revs. I carefully removed the loose urethane, plus an estimated equal amount from the other blade to maintain balance. Not quite the accuracy of a prop balancer, but a run-up test indicated I must have been very close. As I was securing the Jab, airfield owner Sam, a fellow RA-Aus member, drove up. I was introduced to Rick, another RA-Aus X-Air enthusiast who had just completed a scenic flight with a mate. Sam told me he had recently extended the strip from 450m because it apparently had been a bit tight for many aircraft. The landing charge covers unlimited use of the strip while you are there for your stay and Sam insists on driving you and your passengers into town. If that wasn't enough, he also offered to take me flying in his X-Air during the weekend. Sam also volunteered to run me to and from the service station to refuel the Jab. As it turned out, some of my relatives wanted to see our chariot and performed this task for us the next day. Sam then passed me his mobile number to allow me to arrange an early morning pickup time for the return trip.

What service! I can't see how he makes any money from this activity but he obviously enjoys the camaraderie and isn't this what recreational flying is all about? The offer to take us to our hotel was just what we needed. It was approaching sundown and even the short two kilometres to the main roundabout at the edge of town along the Captain Cook Highway still left us with another five kilometres after that to our destination. Plenty of cycle lanes but still not good with only reflectors on the bikes.

Port Douglas is an amazing spot. About 5,000 local inhabitants but numbers swell when special events are on. Plenty to do. Shame we only had two full days there. One was occupied almost entirely pottering up and down the local tributaries in hired pontoon boats demolishing half of the town's supply of king prawns, wine and beer. Some of the crocs on the shoreline looked like they were waiting for an invitation to join the party. I think we were their preferred menu item.

The day to return home came too soon. Sam was on our hotel doorstep earlier than agreed, just to be sure. Quickly arriving back at the airfield, the Jabiru looked ready to go. However, looks can be deceiving.

After setting ourselves up in our seats, donning headsets, pumping the fuel primer and completing the other preliminaries, I reached for the instrument panel switches. A cold sweat came over me. A double check of the volt meter confirmed it. For the second time in the nine year life of this aircraft, I could see the Master switch had been left in the 'on' position. Somehow, I had left it on for two and a half days and the battery was flat. Just a click of the solenoid trying to kick in, but no prop movement. Again, Sam to the rescue. In his car boot was a brand new jumper lead set. He had bought it the day before and it was still in its wrapper.

Captain Cook Hwy from the strip

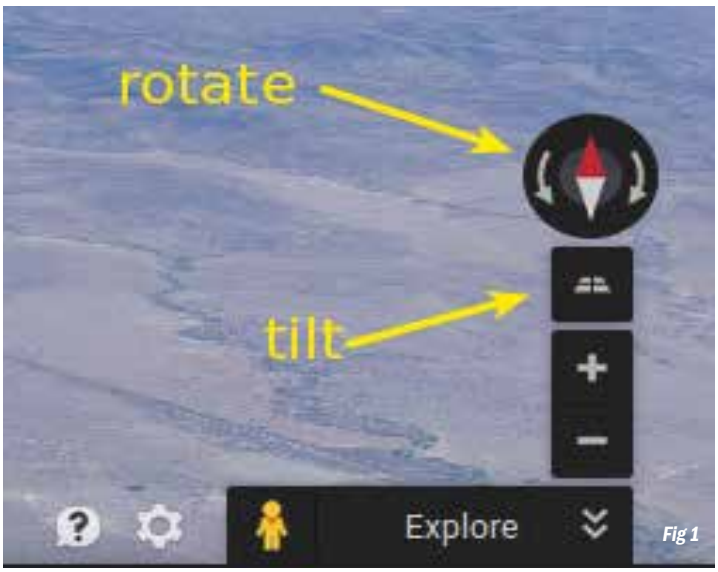


Fig 1


Brake line hole

Running his car with the jumper set connected to the Jab battery for five minutes was all that was needed. The battery wasn't anywhere near charged but had enough to move the prop a little. In fact, only about a quarter of a turn. I have the cold start ignition kit fitted so that was all the engine needed to fire. A total delay of about 10 minutes. We were away. Sam is amazing.

To keep the weight down (Sam's strip is shorter than I am used to) I had only fuelled the Jab with just enough to get safely back to Nebo. My short field procedure probably wasn't necessary, though because we were off with plenty of room to spare.

Calm sky just above the inversion layer at around 3,000ft made for a relaxing trip. Again we landed at Nebo, now feeling like regulars. Final approach with a swerve around the tree on the extended centre line and touchdown. Hard on the brakes to avoid the displaced threshold barricade. Hang on – what's this? The brake lever slid all the way to the end stop. Uh-Oh! No brakes! The steel cable secured cones loomed up fast. I had retracted the flaps as a matter of procedure to reduce the chance of ballooning, but quickly pulled them back on again to act as an air brake. Not enough. I exited the runway onto the grass verge just before we reached the barricade cones and came to rest about 20 meters past them. Anyone watching would have thought it is was a copybook landing and parking effort. If only they knew...

Again, we refuelled only enough to get home from Nebo, plus the usual reserves, to improve our take-off performance. Fortunately we met a miner at the service station who generously offered to run us back (twice) when we had filled our jerry cans. Thanks mate.

I considered the brakes would not be a major problem at home, our next stop. The Pacific Haven runway is 1,000m of tar with a couple of hundred metres of grass overrun. So off we went. Perfect conditions all the way back and arrived home 15 minutes before last light. A great trip.

We had flown about 14.5 hours in total. Some of that was spent avoiding the storm on the way out. We had a tail wind going north but a head wind of similar strength on return. We used less than 250 litres of Mogas, giving an overall burn rate of around 17 litres per hour from the 3300 six cylinder engine. We did take it easy.

I pulled the propeller off the following day and placed it on the balancer just to satisfy myself. In appearance, it looked worse for wear but the machine proved it was as finely balanced as it would be after a detailed balancing job.

There were no cracks in the epoxy sheath, so I laboriously reapplied the leading edge protective coating and rebalanced one more time. Even light rain is a pain. Good thing I bought a half kilo urethane repair pack. The brake failure was the result of the underside fairing at the top of the right main leg lightly rubbing on the black PVC brake line over the past nine years and wearing a pin hole.

I simply replaced the length of brake line left over from the original construction, transferring and reusing the brass fittings. A protective collar has now been added around the brake line where it meets the fairing to prevent it happening again.

Port Douglas? Great destination, great adventure, great people all round. We will return.

Sam is happy for pilots to contact him directly on (07) 4098 5155.

March 2014 and she stands on here own 3 feet for the first time!

Fuselage engine mounting metal fittings fitted

According to plan

BY SCOTT DAWSON

I had always wanted to build a plane, but a kit was out of my price range. I flew a Tiger Moth back in 2000 and fell in love with the concept of open cockpit flying.

I didn't know the first thing about welding so I stayed well clear of metal designs. I settled on a Pietenpol. Little did I know how much welding was involved anyway!

Bernard H. Pietenpol (Pronounced Pete-n-pole) was born in Spring Valley, Minnesota in 1901. He was regarded as Minnesota's premiere aircraft homebuilder and is now widely seen as the father of all home-built aircraft. Pietenpol learned to fly in the 1920s and constructed his first homebuilt in 1923 using a Ford Model T engine.

In 1929, he took a Model A engine two-seat Air Camper he'd designed and built to Minneapolis to show the editor of Modern Mechanics magazine. The plans for the aircraft were published in the magazine and became a favourite homebuilt airplane, which continues to this day. Pietenpol was a self-taught engineer, who designed his own aerofoils and did his own stress analysis.

His original hangar and one of the last planes he built are now on display on EAA grounds at Oshkosh. His grandson, Andrew, flies Bernard's last built Corvair powered plane, continues building Air Campers and sells plans of the aircraft with Bernard's son, Donald.

Having made up my mind to go down this path I bought the plans from the Pietenpol family for around $350.

Many Aussie builders like to use Queensland Hoop Pine for the

Corvair aero conversion

Avon Speedmaster 21" tyres from the UK

My Piet as at March 2014

Building wing spars

Making the instrument panels

According to plan cont.

ribs and other wooden parts, but I wanted to build mine with spruce. I tried to find spruce in Australia but I was told I wouldn't be able to get it here. So I ordered $300 worth from the US. Another builder in Queensland saw my website, contacted me and told me about someone he knew in Newcastle who restored aircraft and who had a hangar full of spruce. I called him and drove over. He did indeed have many planks, which I purchased to build the rest of my aircraft. Freight is the big killer bringing anything over from the US.

I then drew up a new plan for the rib and started building. I chose a Ribblett 612 aerofoil over the original aerofoil because Mr Ribblett said his aerofoil could overcome the sudden stall for which the original Pietenpol had a reputation.

When it came time to weld 4130 Chrome Moly parts, there was no one local who could assist me. I got sick of doing it by trial and error, so I went and did a TAFE course. I then organised another weekend course for a group of aircraft builders in Canberra. It was enough to give me the start I needed. I bought a TIG welder and haven't looked back.

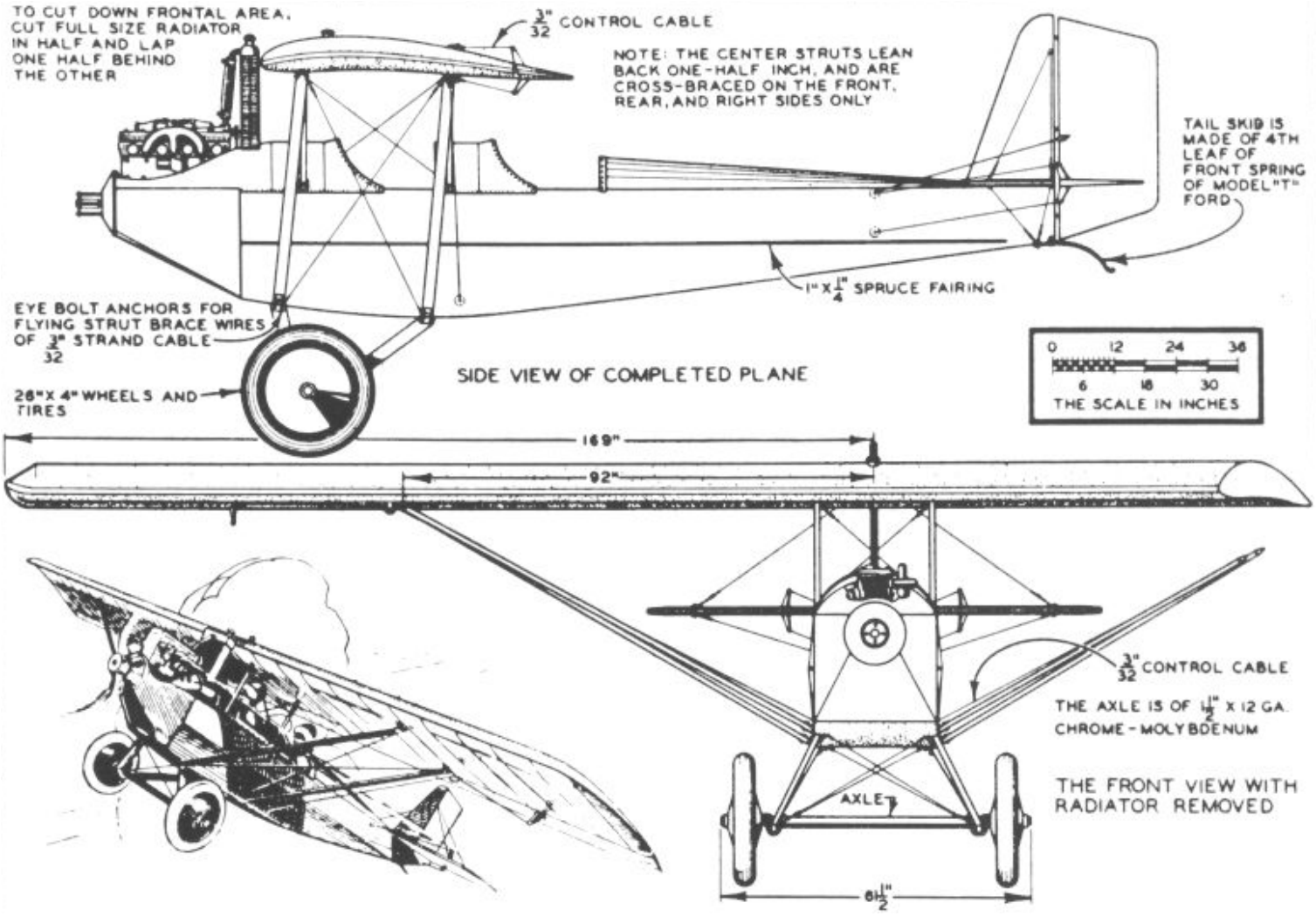
My engine of choice is the Chevy Corvair. This is a horizontally opposed 6 cylinder air cooled engine. It is direct drive and puts out approx 100hp. This engine was used in the 1960's and millions were produced. Despite that, they are rare in Australia and in hindsight, it has been a nightmare of a choice. There are a group of guys in the US who specialise in converting Corvairs for aero use. They are brilliant at what they do, but don't realise there are better ways to communicate with customers. Two years on, I'm battling to try and get my engine out of them, despite having paid for it already. Communicating with them is difficult and they don't seem to be in any hurry to help me because it's their way or the highway. I have a Subaru EA81 sitting in the hangar I could use, but I have already paid for the Corvair.

I am currently building wing spars. Once that is done I will have finished the bulk of the build. Then comes all the little things like plumbing and electrics. I have been working on it sporadically for just over five years. I go months without doing anything, but have just recently moved on to a property with an airstrip so my motivation has increased.

It has been a huge learning curve and I have learned so much from the build process. I have acquired all sorts of tools and skills which allow me not to have to rely on others for help. In saying that, I have also met a multitude of other like-minded folk along the way who have been amazing.

What I can tell you from my experience is that building a plans/scratch built aircraft is cheaper than a kit build, but there is a lot more work involved. I love it. Keeps me sane.

To follow my build, visit www.scottyspietenpol.com.



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Reading the instructions

BY BRIAN BIGG

I HAD JUST BEGUN AN APPROACH INTO MY AIRPORT. AS USUAL I BEGAN TO SLOW DOWN DURING THE DOWNWARD LEG AND CONTINUED TO SLOW AS I MADE THE TURN ONTO BASE.

My aeroplane is so slippery, that if I don't get my speed down early in the circuit, there's no way it'll touch down where I want it to. Normally I bring the speed on Base back to 60kts before putting out the first stage of the flap.

On this occasion as I approached the 65kt mark, my Zephyr started to buffet and shake. "That feels like the beginnings of a stall", I said to myself. But how could that be?

And sure enough, the plane started to get very twitchy as the speed crept down towards 60kts. This was weird. My aircraft stalls at 36kts, not 60, and I knew for certain it quite happily flies around at 50kts on those beautiful afternoons when the sun is going down and there's nowhere to go except round and round in circles enjoying the view.

I also realised that 700ft and descending was no place to investigate what appeared to be new stalling characteristics. I abandoned the approach immediately, applied full power and climbed up to 3,500ft, well away from the airport.

I did a quick HASEL check and slowed down again. Sure enough, as the speed crept back towards 60kts, the aircraft began to twitch and shuffle. Then it stalled crisply at 58kts. My first thought was 'how am I going to get down if I can't slow down? I'll be stuck up here forever!' But after fudging around like a coward for a while, I committed to a landing and brought it down flapless at 65kts.

"Aviation is harsh on you if you don't pay attention"

Safely back on the ground, I began the process of trying to work out just what was going on.

I surmised the problem must have been caused during a recent service. During that service, we took the wing off to inspect it but, when putting it back on, had inadvertently crimped the pitot tube. My ASI was like a drunken sailor afterwards, which was what had alerted me to the problem. We took the wing off again, found the problem and solved it.

But had there been something else? Had we solved one problem and caused another by doing so?

I went up again and found that at 6,000ft the altimeter and ASI agreed with my new GPS completely. The disagreements began as I got closer to the ground. According to the GPS, the ASI began to over-read as I descended, eventually by 10-15kts near the ground. Let me tell you, you do not want your ASI over-reading by 15kts close to the ground. That will kill you quicker than a bullet.

Our local LAME, Mike, put his finger on the problem right away. "You got a static pressure problem", he told me. I must have crimped the static tube with the wing while I was uncrimping the pitot tube. Damn.

Over the next few weeks I pulled everything apart looking for the flaw.

We took off the wing again, blew down the tubes and found there was no blockage (no air travels through the static tube, only pressure).

I pulled the panel out and double checked the hoses leading to the three pressure instruments in case they had leaks in them.

But the problem remained unsolved.

Recently a friend came by to lend a hand. He sensibly told me that if the hoses were all intact, the leak must be coming from the instruments themselves. Were they old?

"Two of them are", I told him. "But the altimeter is just new. I installed it during my most recent service.

Of all the instruments in my aircraft, the altimeter is the only one to have given me trouble. I'm on my third. The first worked perfectly for three years until the morning it tried to tell me I was at 8,500ft (I was still in the hangar). The second one lasted three years too, until a couple of months ago when it refused to budge off sea level.

When I came to buy my third, my distributer told me my usual brand was not in stock, and he offered me a different sort for a similar price. I needed it in a hurry so I said 'sure'.

What did I care about the brand? The damn things only last me three years, so if it turned out not to be any good, it wouldn't be long before I had to replace it anyway.

I had it installed in a couple of hours and it seemed to do the job. Until the day the ASI tried to kill me by over-reading on my approach.

So was it the culprit? Well sort of.

My friend and I uninstalled the ASI, VSI and Altimeter to check if they were still vacuum sealed. He showed me how. You suck gently on the hole in the back then put your tongue across it. If the instrument tries to suck your tongue into the hole, it's vacuum sealed. If not, it has a leak. Not hygienic maybe, but effective.

The ASI and VSI played tongue hockey with me nicely, but the new altimeter did not. As much sucking as I did, it showed no interest in my tongue at all. I had found the leak. Bloody cheap Chinese crap, I railed.

Then my friend picked up the new altimeter and pointed to a label stuck on the side of it. The label read 'Not a sealed unit'. D'oh. It was an altimeter designed for an open cockpit aircraft, like a Drifter, not an aircraft with a cabin like mine. All that mucking around for nothing.

The perfectly good unsealed altimeter went back to the shop in the post and I took possession of my new 'sealed' unit today. Before I install it, I will be reading the instructions several times.

Such a stupid thing and it could have easily killed me. Aviation is harsh on you if you don't pay attention, isn't it?

10 Tips for a successful flight

BY THE OPS TEAM

Successful flights involving hundreds of recreational pilots and aircraft happen every day all over our country. But far too often in recent months, we have been saddened to hear the occasional one has ended in tragedy.

When we trace through the steps which led up to each of these accidents, when we comb through and analyse the evidence and look at contributing factors, it becomes clear some common trends and circumstances are repeated. So what are some of the successful actions, behaviours and attitudes which are often missing in these tragedies?

1. PLAN FOR SUCCESS

We've heard it all before, the 6 P's- Prior Planning Prevents ... and you know the rest. Just the very process of thinking about the flight improves your safety. Researching and recording the key elements will, at very least, identify possible areas of risk to which you can apply judgement, redundancy and, most importantly, some flexibility. It's the chapter before the picture of the plane flying off into the wide blue yonder that really makes the picture perfect.

2. BE COMPLIANT

Yes this sounds like administrative big brother, but incredibly it is a significant contributor to most accidents, particularly fatal accidents. Whether it's about currency, membership, operating in VMC conditions, operating at appropriate heights above terrain or the many other rules and regulations which surround us. The rules are there for a reason and generally it's because they were written in blood of fellow aviators. Simply being compliant is a key contributor to being safe.

3. IF YOU IDENTIFY A POTENTIAL PROBLEM

Stop and think about it. There is no room for red light running in aviation. This starts long before the actual flight. The last minute weather change, the late start, the forgotten items, a compromised pre-flight. During a flight accidents are seldom the result of one thing alone. The warning signs are always there as all the holes in the Swiss cheese start to line up. It appears that if something's not going the way you intended, persisting seldom makes it better. We can't just park the plane in the air while we scratch our heads, but making an early and safe decision, or pre-planning alternative actions regardless of the inconvenience or damage to our pride or plans, is a key way to prevent the chain of events leading to an incident.

4. BE HUMBLE

Accept you are vulnerable. You know you're good, you've been doing it for years. You hear the mumbo jumbo and all its done has made you better at pointing the bone at all the other idiots out there. You consider yourself to be the pillar of the piloting community.

Guess what? You may be next! Research has shown an experienced pilot is just as vulnerable as an inexperienced one, albeit for different reasons. Experience can be your greatest asset and your biggest threat.

Recalibrate your human side before every flight just like you do with the altimeter- reset a known standard and reference to a grounded level of vulnerability and risk. It's that self-assessing look in the mirror which will remind you that better pilots than you have failed before.

5. DON'T DOUBLE DATE

Getting caught out with an unexpected threat is never good. Only ever do one new thing at a time. If you've got a new aircraft, fly it in familiar conditions and in a familiar place. When performing cockpit tasks, focus on one thing at a time. Pick the best day to go to a new destination. Handling any one new situation is enough in a dynamic flying environment. It's all about minimising risk. Too many first flight fatalities are testament to the dangers of trying to do too many new things at once.

6. CHECK IT AGAIN SAM

Everything from double checking the fuel pump, canopy or door latch. Nine times out of ten you'll probably get away with it. One day you won't.

Get into the habit of rechecking everything you do and, if you have willing helpers, cross check everything. Using a checklist is a smart way to make sure important items are not forgotten or left out.

7. LEAD ME NOT INTO TEMPTATION

You can say no. No to yourself and no if under pressure. Get-there-itis leads the hit parade, but it's not the only thing waiting to get you. The busy fly-in attendance, following the leader, taxiing like sheep to use a tailwind runway and peer pressure can all be catalysts to do something you normally wouldn't. By not succumbing to this threat you demonstrate true command thinking and the rewards will follow. Good piloting is not a popularity contest, but a skilful and honest assessment of all elements which will provide the safest outcome for your experience.

8. STAR IN YOUR OWN MOVIE

Not your GoPro film on Facebook! Take the leading role in the best performance of your life every time you fly. Actors do it and so do all professionals. There is no room for complacency in the cockpit. If you don't work to improve something on every flight in at least one aspect, then dynamically you are destined to go backwards. True aviators never stop learning. They hunger for knowledge as much as they do for adventure and know the application of knowledge is the key to being a better pilot. They seek out information and different experiences by flying different types.

Become your own instructor as well, never forgetting their pearls of wisdom and fly like he or she is watching you all the time. On top of all of this, don't wait for your BFR every two years. Take a check flight with someone different at least once a year- perspective is a wonderful thing.

9. GO SLOW

Flying is the fastest way to travel, so why rush it? Whether you are learning or a seasoned pro, when we slow down our mental approach to flying we create airspace for true decision making. Our actions will be more deliberate and considered and visible to others. We allow a place for well-developed procedures to operate and, most of all, we mitigate errors.

Oh and yes we get to enjoy and savour the experience. Put on your pilot face before you leave home and keep it there until you safely return.

10. ENJOY YOURSELF

This statement was published in a flying magazine years ago. It was captioned under a picture of a Stearman arcing over the top of a perfect loop. It read;

"One of the greatest safety devices in the world is a free state of mind, a happy state of mind on the part of those at the controls". Eddie Rickenbacker 'Flying Magazine 1973'.

Prop Me Up

DESIGNING YOUR OWN AIRCRAFT BY DAVE DANIEL

It's only a guess, but I'm pretty confident that, before the birth of rockets, the phrase, "It's not exactly propeller science" must have been in common usage.

Propellers are essentially a collection of highly twisted wings experiencing both translational and rotary motion at high speeds while operating in close proximity to each other - so it should come as no surprise the aerodynamics involved in their design is anything but simple. Bearing that in mind, this column is clearly not the ideal forum for an in-depth discussion of blade element theory or vortex lattice methods (so there's no need to panic), but if you really do want to design your own propeller from scratch I'd be more than happy to recommend some excellent textbooks. What I am going to do is look at the anatomy of a propeller and try and cast some light on why it is built the way it is and what constraints a propeller designer is up against.

PROPELLERS DEVELOPED RAPIDLY AS A TECHNOLOGY

The Wright Brothers' success as pioneers of powered flight was due, in no small part, to the remarkable advances they made in propeller design. The twin propellers on the original 1903 Wright Flyer were capable of a peak efficiency of 66 percent, far ahead of their contemporaries. More amazingly still, just two years later in 1905 the propellers on the Wright Flyer III could achieve 82 percent efficiency, an entirely respectable figure even by today's standards.

At the most basic level a propeller is a device to convert mechanical torque into aerodynamic thrust, a task it has to achieve with a high level of efficiency, and preferably without breaking, which highlights the two principal areas on which a propeller designer has to focus - strength and aerodynamics.

As a starting point, Figure 1 gives the anatomy of a propeller blade and Figure 2 shows how the airflow experienced by each section of a propeller blade is a combination of the forward speed of the aircraft and the rotary motion delivered by the engine. The speed due to rotation at a given point along a propeller blade is proportional to the distance out from the prop hub, so both the apparent airspeed and direction vary as you move along the blade from root the tip. This explains why the blade needs to twist from a course to a fine pitch to achieve a consistent angle of attack along the whole blade and thus maximise thrust. The varying airspeed also drives a need for a thinner blade section towards the tip to minimise the drag at higher speeds.

For a fixed pitch prop there will only be one airspeed and RPM at which peak efficiency will be achieved, corresponding to the whole blade operating at its peak lift-to-drag ratio. At either side of this optimum operating point, the efficiency reduces as the propeller's angle of attack moves away

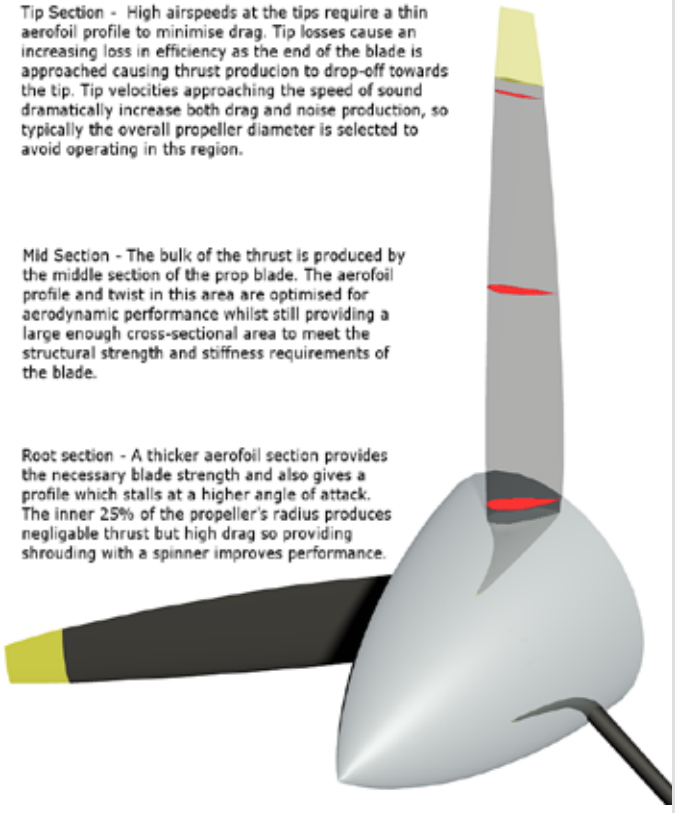


Fig.1 Propeller blade anatomy

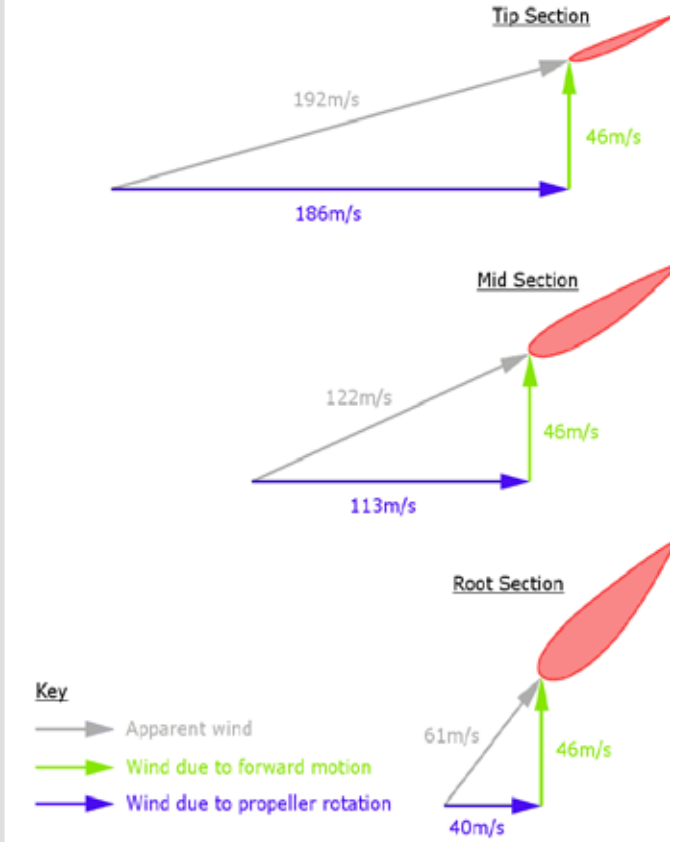


Fig.2 Components of the apparent wind at each blade section of a 1.42m (56") diameter propeller travelling at 90kts and 2,800 RPM

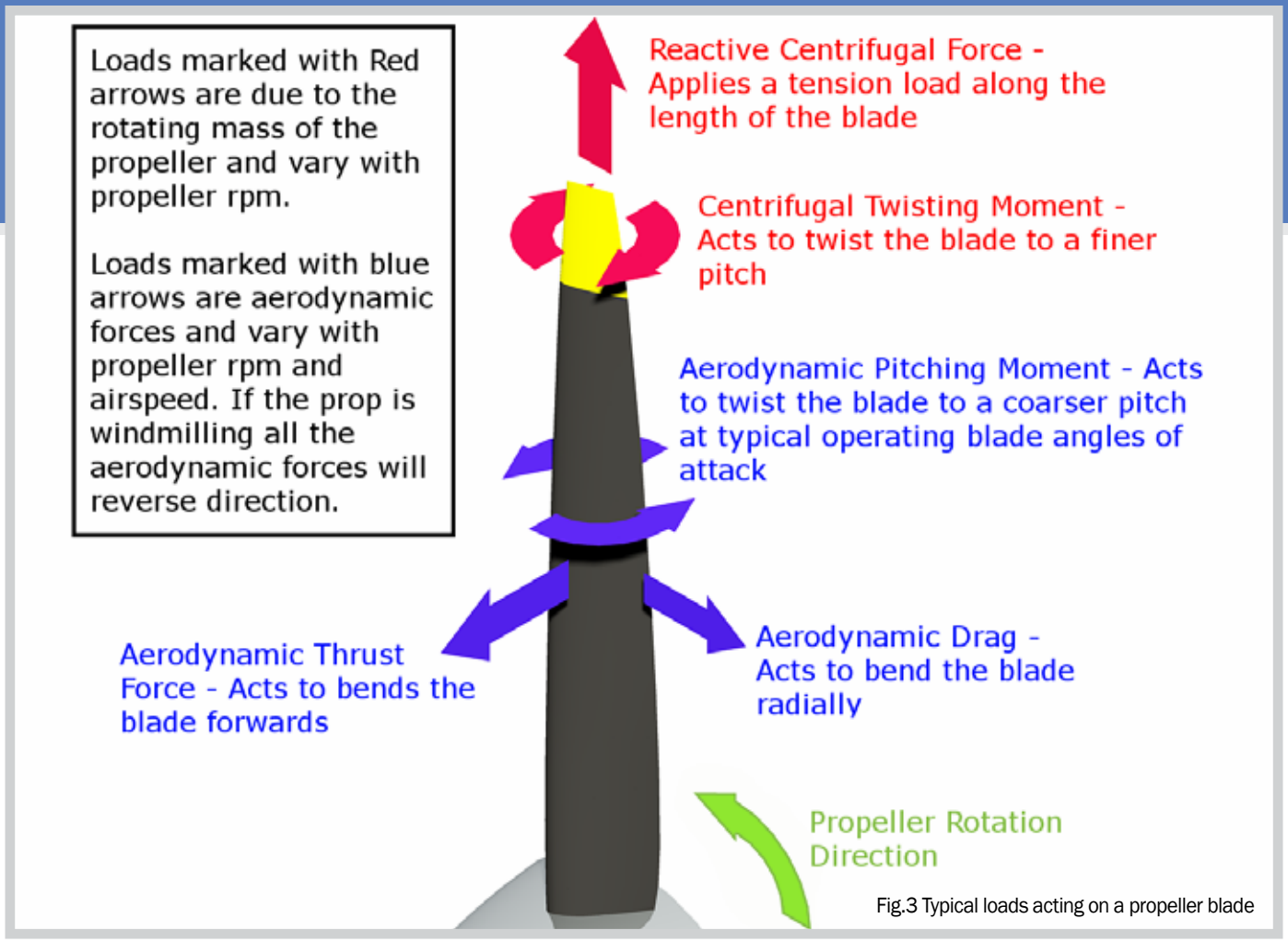


Fig.3 Typical loads acting on a propeller blade

from the ideal value. When there is little or no forward speed, the blade angle of attack will be higher than the optimum and, in some cases, the inner section of the propeller may even be stalled. This not only limits the static thrust but the increased drag also limits the static prop RPM. In comparison, high forward speeds reduce the blade angle of attack, which causes the thrust to reduce as the airspeed increases beyond the optimum value - effectively limiting the maximum speed of the aircraft. It can be seen from the above that a fine prop blade setting (i.e. a 'climb' prop) will be optimal for low speed thrust and increased static RPM, whereas a coarse setting (i.e. a 'cruise' prop) will maintain its thrust at higher airspeeds, but perform less well at lower airspeeds and give reduced static thrust.

Propeller theory dictates that, for maximum efficiency, a prop should have as large a diameter as possible with the minimum possible number of blades. However as a propeller's diameter increases the tip speed increases too, creating a practical limit to prop size, thanks to a rapid loss in efficiency and large increases in noise as the tip speed nears the speed of sound. As a rule of thumb, wooden props with thicker sections are limited to a tip speed of about Mach 0.6, metal propellers can be made to work up to Mach 0.8 or even beyond, with composite props typically falling somewhere in between the two. Turboprop aircraft with large props can often be seen sporting swept tips and scimitar shaped blades specifically to manage the higher tip speeds at which they are required to operate. The swept planform gives the same benefits as swept wings on high speed aircraft designed to operate in transonic conditions. Delivering more power requires an increase in propeller area but the limitation on prop diameter requires either the use of wider blades or adding more of them, both of which negatively affect performance because wider blades reduce the blade aspect ratio and more blades increase interference effects.

As well as achieving acceptable aerodynamic performance, a propeller must be strong enough to resist the many different loads imposed on it. There are the obvious thrust and drag loads, but also centrifugal loads which act radially and also induce twist, plus twisting loads due to the aerodynamic pitching moment of the blade aerofoil. As if that wasn't enough, superimposed over these relatively constant loads are additional cyclic loads.

Obstructions to the airflow close to the propeller and any misalignment between the general airflow and the propeller's axis cause varying aerodynamic loading on top of the regular torque pulses delivered by the engine.

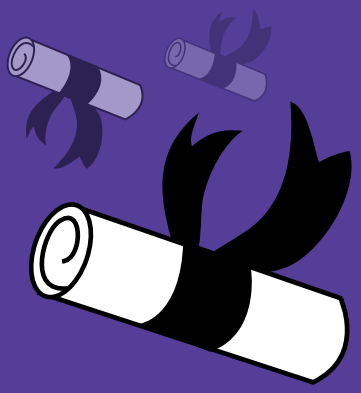
This type of cyclic loading is perfect for producing fatigue failures, especially as an average prop is notches up over 150,000 load cycles per hour. Fortunately wood and composites have excellent fatigue properties. But for metal propellers, fatigue strength is a major design consideration. Cyclic loading problems can also be exacerbated if the loading frequency coincides with any of the propeller blades' resonant frequencies. Wood provides a high level of damping and composite propellers are normally lightweight and stiff enough to have a resonant frequencies comfortably above the normal operating range. But for metal props, resonance can be a real issue often resulting in a prohibition from operating in certain RPM ranges.

When it comes to strength generally, the material from which the propeller is made strongly impacts the design. Wooden propellers have to be built thicker to achieve adequate strength, which inevitably comes at the cost of some aerodynamic efficiency, but they are cheaper to produce and relatively easy to repair. Composite propellers are increasingly popular, offering many of the benefits of a metal propeller, such as thinner blade sections, but without the cost and weight.

Composite props are also often ground adjustable, allowing the performance to be tweaked to suit their intended use. Metal props can use thinner aerofoils and are arguably more durable than wood or composite, but are expensive, heavy and usually designed for much higher power levels than those typically found on ultralight aircraft.

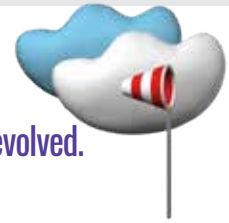
What a remarkable piece of engineering is the humble propeller. Join me in being amazed that a one and bit metre long lump of carved timber can drag you through the air at 200kmh!

NEXT MONTH **Spinning**



Blowin in the wind

BY PROFESSOR AVIUS **AVIATION GURU**



As recreational aviation has evolved over the years so the decisions we need to make have also evolved. How are instructors handling the decision aspect of a pilot's training?

Of course, during their training we do our best to explain the decisions we are making and involve the student as much as possible. But a quick look through the RA-Aus incident and accident reports highlights a possible anomaly.

The stats point to decisions as being one of the biggest problems areas, in particular decisions surrounding aircraft performance. When we think of performance, we think of things like speed, climb rate, fuel burn and usable load. But there is far more to aircraft performance we need to consider.

Thanks to the growth in the numbers of light sport aircraft, we are blessed with a plethora of choices and, with this variety, comes massive differences in the performance and handling characteristics.

One of the more common and popular categories to emerge is aircraft which seem to defy conventional aerodynamics - incredibly low stalling speeds (low wing loading) combined with respectable cruising speeds and lifting ability.

What this boils down to is there is now, more than ever, a real need for performance to be considered before each flight, particularly when conditions are marginal.

The Foxbat is a perfect aeroplane to use as an example. This aircraft has an incredibly well designed wing and airofoil. I am sure most of us have been impressed watching the performance pilots get from these machines. However, sometimes on take-off, while the wing is working quite well at incredibly low airspeeds, the rest of the aeroplane (or the pilot) is not yet ready to fly. What can happen is that the aeroplane gets airborne quickly, either with a burst of throttle, or puff of wind, but the primary controls may not be responsive enough yet to control any chop or other adverse condition. The pilot might also be surprised by how much input is needed to just keep it straight.

SO WHAT CAN WE DO ABOUT IT?

Do we do any type of performance calculations in recreational flying? With some exceptions, I'm sure the answer is generally no. And while in most types runway length isn't usually a problem, there are other factors we need to consider before firewalling the throttle.

As altitude and or temperature increase, air density reduces. This means your engine, propeller, wings, flying surfaces and controls are interacting with less air. The engine will produce less power and the wing will need to travel faster through the (less dense air) to compensate. This means that during the take-off roll, the aeroplane will feel sluggish and take a greater distance/time to get all the science working. So a pilot can easily fall into the trap of trying to rotate too early on a take-off roll, which will only slow the acceleration further and could lead to an upset.

When operating at high elevations, or on hot days, as you line up on the runway, take a moment to consider how your aeroplane will behave. The take-off roll could be as much as 50% longer than at a sea level or during a cold temperature take-off. So plan to be on the ground longer and be gentle when pulling your bird into the air.

Another thing to consider is gusty wind, in particular gusty crosswinds. Your POH will list your aircraft's maximum crosswind limitation. Never attempt to take-off or land in conditions exceeding this limitation. A simple rule of thumb for determining the crosswind component is - Estimate the wind strength using the wind sock, a standard windsock is 20kts when horizontal - Estimate the angle between the wind direction and the runway heading, or use the ATIS if available.

Angle between wind direction and runway heading	Crosswind component (% of wind strength)
30°	50%
50°	75%
90°	100%

This is a rule of thumb only and you should consider the gust strength and the maximum angle being encountered if the sock is flapping around and changing direction.

"It's all about preparation"

TAKE-OFF TECHNIQUE

Before take-off, as always, the pilot should give himself a safety brief, but in gusty conditions add extra considerations.

All aircraft list a TOSS (Take Off Safety Speed) in the POH. This speed is useful when considering a take-off in gusty winds, particularly in aircraft with a low wing loading.

This can be considered as your Safe To Climb Speed after rotating.

If there is a strong crosswind, apply full into wind aileron during the take off roll, gradually bringing the stick back to neutral as speed increases.

Delay rotation slightly.

Once airborne, allow the nose to weathercock into the wind, achieve TOSS and climb out with the wings level. Let the aeroplane do most of the work, remembering every control input you make increases drag, so concentrate on doing as little as possible.

APPROACH TECHNIQUE

Approaches in gusty winds need to be handled with caution. Low inertia aircraft are very susceptible to wind sheer and the pilot should prepare for the effects of this as part of his mental pre-landing checks.

If you know the gust speed, add 1/3 of it to your approach speed. Consider delaying flap, or using less flap.

Coordinate rudder and aileron and always be prepared to go around if the approach doesn't look right. A go around is not a mistake or a failure, but continuing a bad approach is.

It's all about preparation. Consider how the conditions are likely to effect you before you hit the go button, not afterwards. And remember, we fly for fun. If conditions are horrible, it may be more fun to leave it in the hangar.

Finding a plan

THE BEST BITS ABOUT BUILDING YOUR OWN BY DAVE EDMUNDS

Kitplanes magazine is the only source (as far as I am aware) which produces a directory of available homebuilt designs. Its database includes more than 1,000 designs - from super-basic rag and tube designs to the pressurised Lancair Legacy with an estimated build cost of USD$400,000 to $500,000.

You can spend many happy hours day dreaming while playing with its advanced search facility (if you subscribe). The directory includes both plans-built and kit-built aircraft and is not restricted to ultralight designs.

The advanced search facility is useful to get an idea of performance. Try entering a maximum stall speed of 50mph and see what you get. If the cruise speed is much over 105mph, you can pretty well guarantee it has a stunningly expensive engine or the performance stated by the designer is wrong.

For example, some of you may not have heard of the AMF-Super 14D Maranda. It looks pretty good, has a stall speed of 39mph and a cruise speed of 120mph. The big problem is that the recommended engine is the Lycoming 0320, a fine 150 to 160hp engine which costs about USD$65,000. I have discussed this performance issue before.

> "Statute miles are based on the pace of a Roman Legionnaire"

Incidentally, Kitplanes quotes performance in miles per hour. There is some rationale for the use of the meter. A meter is 1/10,000 of the distance from the equator to the poles. Nautical miles make sense because 1nm is one minute of arc at the equator. Statute miles, though, are based on the pace of a Roman legionnaire, modified by the Gauls. As such it makes absolutely no sense in aviation. Yet pilots continue to use the statue foot as a measure of altitude.

In Australia, we use the nautical mile for distance where the Americans have stuck with the statute mile. It all makes no sense at all.

No doubt readers interested in measurement will be fascinated by my discussion next edition of my new fractional digital caliper.

Returning to performance, the Kitplanes' directory gives you an opportunity to filter through a large range of designs to see just what might be possible. It is my belief the quoted performance for most of the aircraft must have been determined on a very good day, but nevertheless there is some internal consistency.

In a previous article, I suggested there was a performance sweet spot for our purposes.

That is - two seats, a stall speed of 40kts, cruise speed of 100kts using an 80hp to 100hp engine. Entering 50mph stall, 100mph cruise and engine power of no more than 110hp into the database brings up 131 of the approximately 1,000 designs. Some of these are no longer available, some are plans only, and some are just weird. But some are very interesting.

When thinking about this article, I intended to write about getting started with plans-built aircraft, but this is not getting any easier because the industry, following the demand, has moved to primarily providing kits. Many years ago, the SAAA published designs for test pieces.

The designs were available in either wood or metal and were intended to be built from hardware store materials for a few dollars. The designs included a range of techniques which would be required to build aircraft and they had to be built and inspected before approval was granted for the aircraft to be built. There appears to be no current alternative, which is a pity.

Many of the kit manufacturers offer some parts which can be purchased separately, such as a rudder, which allows a potential builder to see if this is a project which suites them. Vans Aircraft offers a toolbox kit for $28 as a build demonstrator, which looks to be a good idea.

Winter in Crookwell – stay indoors or get out and enjoy?

Building an aircraft from plans does not require much in the way of workshop skills, but it does require a considerable amount of tenacity, patience and a willingness to experiment and learn. The major exception, in my opinion, is welding structural pieces. This requires not only a fair amount of experience, but a good theoretical understanding concerning the effect of the process on the alloys being welded.

When I built my Teenie 2 from plans, I had two ideas in mind. I had given up flying for some years when the monthly trip to Canberra Airport to fly circuits in a Cessna 172, just to keep current, proved both expensive and frustrating.

At the end of the hour, I had spent money just to mark time. So I thought if I had a very small cheap aircraft, I could keep current, have fun and still hire the Cessna for trips. Crashing the Teenie 2 put an end to that plan.

I learned a lot over the ten years of that project. I had always wanted to use my hands and wits to complete a project of this sort and I did it. One of the things I learned is that, over the build period, your mission is likely to change and, unless you are very experienced, you are unlikely to save money, compared with the cost of buying a good second-hand aircraft.

But, regardless of the logic, I still want to do it again, hence the return to the Kitplanes directory.

AND ALSO

I have finished the engine CHT and EGT monitoring instrument I have been writing about over the past year. The design is published on github.com. I have uploaded screen shots, electronic details, source code and explanatory notes. Search for 'cht egt' on the Github site.

Github enables users to 'fork' a design to produce another version. Hopefully this will happen and the design will evolve to include other transducers and more complete engine information.

On searching the internet before uploading the design, I was surprised to find there was no open source equivalent. I have kept the design as simple as possible to try and make it accessible, but there is no such thing as a free lunch.

Hopefully next month I will have it installed and working in my aircraft. If the weather warms up a bit (Hypothermia is a real risk in Goulburn at the moment as the photo taken just north of Crookwell in the Goulburn district shows).

Hopefully the photo also shows just why someone might want to fly.

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Syndicate Share for sale. Long running, well managed syndicate operates at Caboolture airfield. Run by members for members benefit. Current aircraft is a Foxbat A22-LS. 100hp Rotax, Dynon instruments, Mode S Transponder, Tundra tyres, centre stick and low hours. Please call Paul Taylor on 0448 497 934 for details.

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INDEX

CAGIT MOVES RIGHT ON

The Come and Get It Trophy didn't stay long on the Gold Coast, as you might expect. Michael Lawrence brought it all the way from Western Australia to Heck Field in June only to see it grabbed again a month later and taken further south.

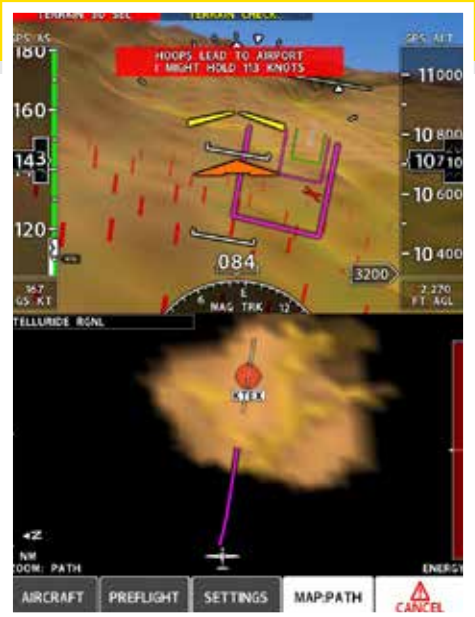
David Carroll of Central West Flying at Bathurst is its proud new holder. You can talk to him on 0408 863 956 if you think you've got what it takes to seize the trophy for yourself.

For a full list of the rules about capturing the CAGIT visit raa.asn.au/events/cagit-trophy. Also Dexter Burkill's great Facebook page is a valuable resource if you are planning a move on it. www.facebook.com/CagitHunters?ref=hl

WHERE IS CAGIT?

Michael Lawrence (L) hands the trophy to its new owner David Carroll

ADVERTISERS INDEX



XAVION CO-PILOT APP

Xavion is both a glass cockpit and a co-pilot which runs on iPad or iPhone, providing synthetic vision, GPS navigation, instrument backups and ADS-B weather (in the US).

It can provide the basics like weight & balance checks, estimated fuel burn and time to your destination at various altitudes.

But the big selling point is that Xavion learns the glide characteristics of your airplane, so as you fly along it illuminates the area on the map you could reach with power-off. Also, if the power does goes off, it shows the range of the steepest and shallowest glides your airplane can make, corrected for wind.

Each time you take off, Xavion also remembers the distance you took to get to 50ft above the ground and memorises the altitude and weight for each take-off. Then, every time you line up, the software compares the runway length you have in front of you to the take-off distance you have used in the past, taking into account altitude and weight, and it gives an indication how much runway it thinks you are likely to use. Plus lots more.

- **PRICE** $19.99 USD per month
- **WEB** App store or www.xavion.com

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The Faro G2 is meant for the pilot who wants active noise cancellation, doesn't want to pay a fortune for it and is prepared to accept less than the top of the line units provide.

The unit features large soft cushioned ear pieces and a noise cancelling electret

microphone with fully adjustable microphone beam with wind screen. It provides 23 dB in passive noise reduction and

an additional 29 dB of active noise reduction, for a total of up to 52 db.

An included auxiliary cable lets you plug in your phone or music player.

- **PRICE** $389.99 USD
- **WEB** www.faroaviation.com

MODE S TRANSPONDER

The new Trig TT31 has been designed to meet the European elementary surveillance requirements, as well as fitting the same mounting tray as the popular KT76A/C transponder, making it ideal for new or retrofit installations. The TT31 has a backlit graphic display, rotary knob for setting squawk code and flight ID.

By linking the TT31 to your GPS receiver, the unit can transmit position information to appropriately equipped ground stations and other aircraft. The TT31 will also be field upgradeable to support Traffic Information Service (TIS) functions, where available, by interfacing to an appropriate cockpit display.

- **PRICE** $3,925 AUD
- **WEB** www.ozpilot.com.au

FOLD UP ELECTRIC BIKES

Here's a possible future solution for getting from the airport into town. The Ford Motor company has unveiled two prototype folding electric bikes.

The MoDe:Me and MoDe:Pro e-bikes are equipped with 200-watt motors with a 9-amp-hour battery which provides electric pedal assist for speeds of up to 25 km/h. The prototypes also have rear-facing ultrasonic sensors. This warns the cyclist when a vehicle is overtaking, by vibrating both handlebars, and alerts motorists of the presence of the e-bike by illuminating handlebar lights.

With the accompanying App, handle-bar grip vibrations also let the rider know when to turn and triggers the turn signal automatically for safety. The App can identify bike-friendly roads, hazards and alerts, and will be able to sense and communicate with other vehicles.

Will these bikes go on sale soon? Ford isn't saying. It calls them 'experiments'. Such a car company.

- **PRICE** N/A
- **WEB** www.media.ford.com

Blimpy visitor

BY NORM SANDERS

This blimp went by the field the other day, so I jumped in my trusty Sonex and gave chase. It didn't take long because the blimp was only going 40kts or so. (Its two Limbach motors were doing their best!).

I had to use full flaps and much reduced power to keep from racing ahead of it. It is the only one presently in the southern hemisphere. You can read more about it on: Legend Blimp - Appliances Online.

And in case you are wondering how the blimp got its name:

Colloquially non-rigid airships were always referred to as 'blimps'. Over the years several explanations have been advanced as to why. The most common is that in the military vernacular, the Type B was referred to as 'limp bag', which was simply abbreviated to 'blimp'.

An alternative explanation is that on December 5, 1915 A.D. Cunningham, R.N., who designed the SSZ type, flipped the envelope of a non-rigid airship with his fingers during an inspection, which produced a sound he pronounced as 'blimp' and that the word then caught on as the nickname for all small non-rigid airships.

Whatever. It was a nice sight, anyway.

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

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