SPORT PILOT

For recreational pilots
JUNE 2015 VOL 46 (6)

RECREATIONAL AVIATION AUSTRALIA

New Syncro lands in Australia

SPECIAL SUBSCRIPTION OFFER INSIDE

GM REPORT: FINANCES IMPROVING

BUYING AN AIRCRAFT: IT MAKES SENSE

THE SEARCH IS ON FOR OUR FIRST AIRCRAFT

ISSN 1839-0501
RRP $8.80 inc GST
9771839050238

TECNAM
AUSTRALIA

TECNAM 65° Astore 1948 - 2013

RELENTLESS INNOVATION

ASTORE

P92 EAGLET G5

P92 ECHO CLASSIC

P92 TAIL DRAGGER

P2008

P2010

P92 SEASKY

P2002 JR / SIERRA RG

SNAP

P2006T

P2006T MMA/MRI

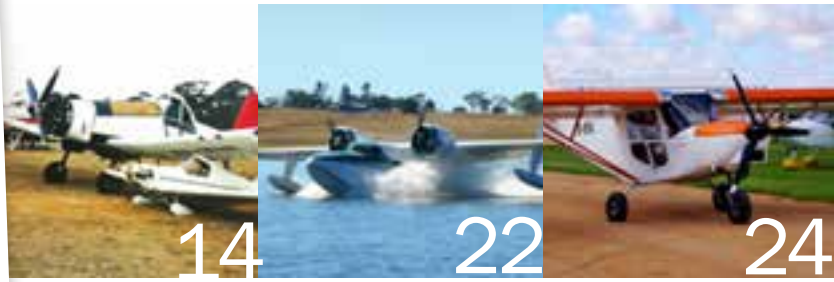
P2012 TRAVELLER

UNRIVALLED SUPPORT

Fly with us. P: 07 5564 1801 M: 0416 083 800 E: tecnam@bigpond.com www.tecnam.com.au

Cover: A Fly Synthesis Syncro
Photo credit: Silent Wings Aviation

Contents



Regulars

Columnists

News

Reader stories

Features

Cover story

Fly-Ins

Extras

"The design allows a cruise speed of more than 130kts"

SPORT PILOT

Sport Pilot Magazine is an official publication of Recreational Aviation Australia Inc. and is published 12 times a year by Stampils Publishing.

To subscribe to *Sport Pilot*
Email: admin@raa.asn.au
Ph: (02) 6280 4700

STAMPILS PUBLISHING
All Enquiries Ph: 1300 838 416
7/1 Grandview St, East Ballina NSW 2478

EDITOR
Brian Bigg
editor@sportpilot.net.au

ADVERTISING SALES
sales@stampils.com.au

ONE MAGAZINE - TWO FORMATS
RA-Aus members get *Sport Pilot* free of charge online at www.raa.asn.au. But if you are not a member or would prefer a hardcopy magazine, here is how you subscribe.

MAGAZINE SUBSCRIPTIONS

CATEGORY	6 MONTHS (6 ISSUES)	12 MONTHS (12 ISSUES)	24 MONTHS (24 ISSUES)
Member (flying)	$50	$90	$160
Member (non-flying)	$50	$90	$160
Non-member (Magazine Sub only)	$60	$110	$220

Prices include GST.
Contact RA-Aus headquarters at the address on this page

HEAD OFFICE
PO Box 1265 Fyshwick
ACT 2609 Australia
Unit 3, 1 Pirie Street
Fyshwick ACT 2609
international: +61 (2) 6280 4700
national: (02) 6280 4700
fax: +61 (2) 6280 4775
Email: admin@raa.asn.au
www.raa.asn.au

ENQUIRIES
Memberships:
members@raa.asn.au
Members Market:
membersmarket@raa.asn.au

ARBN 070 931 645
ABN 40 070 931 645

National Finance and Administration Manager
Maxine Milera admin@raa.asn.au

CEO
Michael Linke ceo@raa.asn.au

National Operations Manager
Jill Bailey
ops@raa.asn.au
0400 280 087

Assistant Operations Manager
Neil Schaefer
ops@raa.asn.au
0428 282 870

National Technical Manager
Darren Barnfield
techmgr@raa.asn.au
0417 942 977

Assistant Technical Manager
Jared Smith
jared.smith@raa.asn.au
0418 125 393

National Safety, Risk and Compliance Manager
Katie Jenkins
safety@raa.asn.au
0418 445 652

RA-AUS BOARD ELECTED STATE REPRESENTATIVES

TASMANIA
Eugene Reid
0428 824 700
tas1@raa.asn.au

NEW SOUTH WALES
Andrew Saywell 0414 962 648
nsw1@raa.asn.au

Michael Apps 0412 435 198
nsw2@raa.asn.au

Michael Monck (President)
0419 244 794 nsw3@raa.asn.au

NORTHERN TERRITORY
Mark Christie
0412 345 111
nt@raa.asn.au

SOUTH AUSTRALIA
Ed Herring
0408 787 018
sa1@raa.asn.au

NORTH QUEENSLAND
Ross Millard 0422 119 051
nqld@raa.asn.au

SOUTH QUEENSLAND
Trevor Bange 0429 378 370
sqld1@raa.asn.au

Mike Smith 0418 735 785
sqld@raa.asn.au

Tony King (Secretary)
0400 226 275 sqld2@raa.asn.au

VICTORIA
Rod Birrell (03) 9744 1305
vic1@raa.asn.au

Jim Tatlock (Treasurer)
0403 228 986 vic@raa.asn.au

WESTERN AUSTRALIA
Ed Smith 0409 962 050
wa1@raa.asn.au

FINDING YOUR NEAREST TRAINING FACILITY, SCHOOL OR CLUB
www.raa.asn.au/schools

AIRBORNE
FLIGHT TRAINING

AIRBORNE

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

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

AIRBORNE
FLIGHT TRAINING

FK9 ELA WB

The first production LSA with diesel power

Extra room and range for touring, with payload and economy to keep you smiling.

Your ideal travelling companion, with any conventional Rotax 912, or the new Turbo Diesel power, running on Pump or Jet A diesel.

The standard FK9 is already 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 evergreen FK9 design with its unique integrated load bearing safety frame, is now proven for 26 years and in this 5th generation version, the FK9 ELA, has been proven for 4 years. Trigear or taildragger available.

The existing FK9 ELA standard body, can also be fitted with the latest German built FlyEco turbo diesel or turbo petrol version, in series production.

Cruise at <8 ltr/hr and fuel anywhere you fly in our vast land!

FK LIGHTPLANES

German engineering and innovation

FK9 ELA

FK12 Comet

FK14 Polaris

FK14 Le Mans

FK51 Mustang

silentwingsaviation.com

phone (02) 43 6930 43

silent wings

Being transparent

BY MICHAEL MONCK

OUR most recent general meeting has come and gone and was well attended at Cessnock, courtesy of the Hunter Recreational Flying Club. Bob Finch, with Don Ramsay and their colleagues, generously invited us to their airfield and club house and hosted the meeting for around 40 people. Our official attendance sheet said the numbers were less than that, but I think those present would agree it was close to 40. And this is despite the weather doing its best to keep people away.

Firstly, I'd like to thank all of those who showed up for making the effort. I always enjoy getting out to meet members and this occasion was no different. I often get told I'm doing a good job and I often get criticism for doing the opposite. But there are two things to consider. One, it isn't only me doing the good job. It's a joint effort involving the entire board and management. And two, it's because people are talking to me.

I get countless emails and phone calls and sometimes I'll miss calling someone back or respond to an email, but keep them coming. Talking to people is how I get a feel for the wishes and desires, together with the gripes and concerns of the membership. Sometimes I don't like to hear the complaints, but I need to.

I won't go into detail about the goings on of the meeting, instead I'd like to talk a bit about something we did a little differently this time. As everyone is no doubt aware, our membership is fairly heavily concentrated on the eastern seaboard, with roughly 2,500 members each in Queensland and NSW and a few less in Victoria. The rest are scattered across the country in pretty much every corner of every state. It creates difficulties in terms of planning a meeting where everyone can attend.

This year, for the first time as far as I am aware, we broadcast our general meeting and the follow up Q&A session live on the internet. I've mentioned in the past that we're now trying to get to see more members across the country by attending local fly-ins. The initiative of broadcasting our meeting is part of the same push for transparency and inclusion.

That said, the recording of the meeting was not cheap (the cost of the actual broadcast is relatively cheap compared to the technical aspects of producing the video). This year we spent around $6,000 to get a good quality recording which will be of use to members (See story in News section). We do have to keep in mind though, if the service is not used, it will be hard to justify in future. There's no point in investing money in something which is of no value or use to people. Let us know what you think, even if it is just by leaving a note in the comments section of the You Tube video page.

On the day after the general meeting, the full board met in Canberra to discuss the ongoing strategic direction of RA-Aus. Again, I won't go into detail because the information is available on the website, but I will touch on two things I think are priorities.

The first is our budget. I have been on the board for around 18 months. I've done some research and it seems that in the years immediately preceding my term there wasn't a budget which predicted a surplus. As well, I have been informed by longstanding staff that RA-Aus has not, for the past 10 years or so, ever had a budget approved before the commencement of the financial year. So this year is the first in a long time we have changed both of these things. We have a budget which is predicting a small surplus and it has been approved almost two full months before the new financial year begins. This means our CEO can do his job effectively.

Secondly, we have told our CEO what he is expected to do in the year and years ahead! Again, for the first time in ages, we have a strategic plan. This new plan gives our CEO guidance on what he should be setting out to achieve. It sets our direction for 2015-18 and gives us measureable objectives which can be used to assess our performance over the period. The full strategic plan document is also available on the website.

All of this means we are no longer flying blind. We know what we want to do and there are no longer any excuses for not doing it. We can report to you, the membership, against these objectives and you can judge for yourselves if we are doing a good job or not.

I guess in some ways nothing has changed from the past, in the sense we have always been responsible for ensuring the interests of members are being looked after. But what has changed is that now we're being transparent. You know what we are setting out to achieve and now we are accountable.

So keep an eye on us and keep talking to us. Get in touch with the great staff in the office if you need to. It's the only way we can move forward as a collective. We're all in this together.

Calendar of events

A 6-7 JUNE

Inglewood Fly-In

Postponed from May due to the heavy rain. A great weekend on Queensland's Darling Downs. Free camping, showers and toilets. RDFS fundraiser. 9am Saturday poker run. Presentations Saturday night. Breakfast Saturday and Sunday from 6:30am. BBQ lunch. Three course dinner under the stars Saturday night. For more information, Stuart 0447 737 002 or Lexie 0407 195 205.

B 6-7 JUNE

Wentworth Queen's Birthday Fly-In

Wentworth is approximately 15nm NE of Mildura. Saturday will be the main open day. Activities will include displays of vintage motorcycles and cars. Three course meal Saturday evening. Breakfast Sunday morning. BBQ lunch and cold drinks available. For more information, Brian Middleton (03) 5022 7783, 0408 690 650 or brianmiddleton12@iprimus.com.au.

C 16 AUGUST

Grafton Wings and Wheels

At South Grafton airstrip. Vintage, classics, sports, touring cars, motorcycles, caravans, boats, go-karts, race cars, engines. Food and drink available. Free entry, free parking. For more information, www.graftonaeroclub.com.

D 7 JUNE

Biggest Morning Tea

The Moruya Aero Club will host a Biggest Morning Tea to help raise money for cancer research and support services. Fly or drive in. The event will begin at 11am. For more information, cameron@ignitionaerospace.com. To make a donation directly. http://nsw.cancercouncilfundraising.org.au/MoruyaAeroClub.

E 20 JUNE

Moree Airshow

The Airshow will run in conjunction with the official opening by the Moree Plains Shire Council of the Gateway development adjacent to the Airport. Paul Bennet will perform for the crowds. Pilots are invited to join us for the show and a casual evening at the clubhouse afterwards. For more information, Bruce Crosby (02) 6752 5822, 0428 526 010 or bcrosby6@bigpond.com.

CANBERRA BIG BOYS TOYS EXPO

F 22-23 AUGUST

Big Boys Toys Expo

Exhibition Park in Canberra. The first of its kind on the east coast. The two-day interactive expo will create the ultimate playground for Canberra and the region's big boys to see, touch, experience and buy all the toys, tools, gizmos, gadgets, sports and hobbies they've always dreamed of. 10-5pm daily. $15 entry. Kids under 15yrs – gold coin. For more information www.bigboystoyscanberra.com.au.

G 29-30 AUGUST

Gathering of Eagles

Watts Bridge Memorial Airfield Inc. invites all aviation enthusiasts to be part of the annual fly-in. The theme this year is 'Remembering Gallipoli'. Overnight camping on the field encouraged. Expect to see a huge variety of aircraft types as well as vintage cars, military vehicles and WW1 and WW2 military re-enactors. On-field catering, three course dinner Saturday evening (booking essential) and breakfast Sunday morning. Coffee and cold drinks available all day. 100LL Avgas available. Admission for pilots and aircrew free with no landing fees. For more information, www.wattsbridge.com.au.

H 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 1600m 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.

I 23–24 OCTOBER

Splashdown

The second biennial Australian Seaplane Pilot's Conference. Rathmines Bowling Club, Stilling Street, Rathmines. NSW. Special guest speakers on topics such as marine parks and waterways access, advanced water operations, alighting area selection, safety tips, surviving an accident (disaster planning), seaplane instructor's forum, maintenance and corrosion inhibition tips. Money back weather guarantee (if conditions preclude attendance). For more information, seaplanes.org.au/splashdown.php, Malcolm Burns mal.767@icloud.com 0448 744 763 or David Geers david@computerdrive.com.au 0418 103 535.

Bristell

Craftsman built
Premium recreational and general aviation
At an affordable price

ANDERSON AVIATION Australia



Well designed, quality construction and class leading performance
from the masters of Czech aviation, BRM Aero.
Contact us to specify your Bristell.

BRM AERO Wings with heart

NSW demonstrations are now available through Central West Flying, Bathurst.
Please contact us for more information.

CENTRAL WEST Flying

andersonaviation.com.au | Brett 0428 355 266

LETTERS TO THE EDITOR

Old fashioned

I read with interest your decision to go digital with *Sport Pilot* and wish to inform you of the following.

I have never successfully turned on a computer. My wife's computer is for her use and she is not prepared to increase her download time or make the computer available to me to browse the e-mag.

I obviously will be financially paying for the publication as you are making it available online and printing copies to be distributed to CFIs. Just how this reduces the cost of the magazine avoids me.

I have no intention of paying a premium to have a printed copy when my membership already includes this publication.

I wait with interest to find out how you intend to notify me of any issues of governance, reports by representatives and anything else vital to my membership and continued participation in flying.

Lastly, I consider that making the magazine available at no cost to the computer literate members and at a charge or cost, no matter how high or low, to non-computer literate members is discrimination.
Robert Maiden

From the Ed - *Robert's letter turned up in an envelope in the mailbox, the first I have received in a long time, and had to be transcribed by me into a word processing program. Any mistakes are mine.*

From the CEO - *I refer you to the President's column Sport Pilot April 2015 about making hard decisions. Sport Pilot was offered inclusive of membership fees when it was a small in-house developed magazine. Today that isn't the case and if we are going to continue to exist we need to recover some costs. You are free to choose to not use a computer, but as a member it is your responsibility to ensure you are familiar with all of the current rules and regulations. Our Operations Manual is now only available electronically and soon our Technical Manual will be the same. Advisory notices are only distributed through our website and our regular electronic newsletter offers a number of interesting articles. You, of course, can arrange printing through a friend or other means.*

Backward step

Yes, that is correct. Fees up 40% to maintain the status quo... that is, to pay my annual RA-Aus fee of $190 plus an extra $70 to $80 for a hard copy of our beloved magazine. It's been a part of our annual fee, so actually its fees up 40%. To add to this, RA-Aus informs us they will no longer put in the effort of running the annual Temora air show/fly-in, but instead will visit other fly-ins which clubs go to great effort to put on. It seems it could be the case that RA-Aus is charging much more in fees and wants to do less for its members.

With the rapid growth in membership and fees I have seen over the past five to six years, it should have created wonderful synergies for RA-Aus, despite the extra work load CASA has required of late. $250,000 or so for computer software to make it easier for staff to maintain records and upgrade the website? Give me a break. My mind boggles at the haemorrhaging of members' funds over the past few years and I would think many others do too. I think RA-Aus is losing its way at this point in time and dumping the mag (a large part of the prosperous path of RA-Aus) is simply a backward step.
A not happy Peter Skinner

From the CEO - *Current membership fees are $210. As you will see by the subscription information in this edition of the magazine we have done a number of things to add greater value. We are now offering 12 editions per year and including some great add-in benefits. Plus we're planning a redesign for the magazine.*

Regarding Temora, the major contributing factor to not offering NATFLY this year was feedback from members and business partners. Attending fly-ins has proven very successful this year so far, with staff and board members engaging with five times the number of members than those who attended NATFLY in 2014.

And finally, yes it's been a couple of tough years for RA-Aus, which is why today we are making some hard decisions to set us up for future success. We strongly believe we have found our way and are taking forward steps and creating sustainability for you and all our 10,000 members.

Keeping informed

Just a query regarding the digital version of *Sport Pilot*. As I understand it, we are required to have a method of advising members of any changes and updates, and the traditional method has been via a newsletter or magazine.

I can see the economic sense in going digital and saving heaps on print costs and mail out, but still printing a number of copies to go to members who still want to receive a hard copy is going to cost more per copy and this appears to be going to be passed onto those members.

So here are my concerns.

Are our membership fees going to decrease?

What happens if those members who still need or want a hard copy don't wish to pay for it - are we going to cut them off? Is that even legal given our requirement to keep members informed?
Martin Hone

From the CEO - *At this point in time, membership fees won't be reducing. Regarding informing members, we have a range of ways of informing members, combined with the need for members to take responsibility to keep themselves informed. I think if we work together on this we can all create a bright sustainable future for RA-Aus.*

Go digital

I'd just like to make comment regarding digitising *Sport Pilot*.

Personally I'm ok with digital formats - actually prefer it. But only if it has been designed specifically for digital presentation.

A good example of this is CASA's Flight Safety. The early digitised editions were atrocious, virtually unreadable. But I find reading it on the iPad quite good now. I don't care for their web version – the same information but presented differently. Go figure.
Andrew Martin

From the CEO - *Sport Pilot is being redesigned from the ground up to ensure it is web friendly. This will include hot links for email addresses and website for articles, advertisers and the members' market.*

Medical drama

When an organisation demands instant, complete and unquestioning compliance with its rulings, even when contradictory, it would also be expected that it work to a similar standard itself.

Yet CASA is behaving like a third world bureaucrat. This is only a very brief overview of my experience.

Safety is a word and a concept subject to exploitation and misuse, an excuse to impose unwarranted conditions on activities for financial, selfish or unethical reasons.

A strong case can be made that CASA's medical section is doing just that to increase

its own power and prestige. There would be no issue with them collecting information for research purposes, provided it is done without undue imposition on pilots. However it is demanding what medical professionals and specialists are describing as onerous and excessive. Details which have no bearing on one's ability to fly.

The medical practitioners I'm dealing with have no respect whatsoever for CASA, describing them as 'box tickers', 'a bunch of bungling self-serving bureaucrats' with one surgeon I spoke to telling me "they don't know anything about medicine, they don't know anything about cancer, they wouldn't know what a prostate is, where it is or what it does."

They have lost my doctors' and specialists' reports on four occasions - three times in a three month period.

They demanded a specialist's report, lost it, then when I sent another copy asked for further information. Exactly the same form letter asking for exactly the same information they had already been sent.

When written to, asking for details of what they required, they did not respond.

Becoming exasperated I wrote to the ombudsman, who told me I should try to resolve the issue with CASA directly. A letter detailing the matter was sent to their chief medical officer, but there was no response, not even an acknowledgement of receipt.

Contacting the ombudsman again resulted in being directed to the CASA Complaints Commission.

A reply via e-mail was received from them requesting I call. After I summarised my experience, the matter was referred to another bureaucrat who seemed helpful and understanding. He referred to another person to determine what was required. Regrettably, six months after exchanging emails, this too seems to have run into a dead end.

I gave a copy of their last communication to my specialist, who could not understand why they wanted it. He complied but said in the last paragraph of his report "I cannot understand why you keep asking the same thing again and again. This was all sent to you already."

CASA's now requires more information, including 'presenting symptoms'. Everything they've now asked for is already in their possession. Apparently CASA's doctors are incapable of understanding medical terminology. It is now years out of date and irrelevant.

Indications are that there is no determination, no real intention to resolve the case, simply to pretend to be doing something. Certainly not what would be expected from professionals?

This is now entering its third year, has cost me a four figure amount and achieved nothing. It has only wasted the time of medical professionals who should be treating people with real, not bureaucratic, problems.

While my main flying activity, soaring, has not been affected, nor has flying recreational aircraft, the delay has placed an increased burden on the other tug pilots in the gliding club of which I am a member.

I have also started a Facebook page 'ground CASA' and invite others to post their experiences there.

www.facebook.com/pages/Ground-CASA/597893993620979?skip_nax_wizard=true

Ted Gaida

Yes minister

I applaud Ray Carter's letter to the Editor ('CASA critical' *Sport Pilot* April 2015). CASA's statements in the related article on Jabiru engines (*Sport Pilot* February 2015) seem to be non-factual verbiage rather than statements of fact.

Some facts, which CASA seems to be ignoring like an elephant in the room, are the figures from US where Jabiru was recently ranked second safest aircraft in their list of nine major manufacturers. It also showed an unblemished record for Jabiru having no fatalities.

There seems to be no logical reason for CASA's intervention in the business of the only all-Australian aircraft designer and manufacturer and the livelihood of all of the flying schools who use Jabiru. The silence is deafening.

Those disgruntled Jabiru owners who have had problems which may have caused an outlanding (Don't fly over anything you can't land on - remember?) have apparently brought many of the problems on themselves through non-compliance of recommended updates. If you own an aircraft it is your responsibility, not your LAME's, to ensure all of the AD's are complied with.

Having owned a Jabiru for almost 20 years and having no fault to find, I for one will be very glad when CASA decides that enough is enough and the restrictions are lifted. I consider an apology would be in order, but am equally sure that won't happen. Perhaps a class action against CASA is in order. Until the data which CASA claims it used as the reason for the restriction is made public, unfortunately nothing can proceed.

I did write to both state and federal Ministers of Aviation, who had obviously been well briefed by CASA because neither reply contained any reason and basically said that's how things would remain until CASA decided to do something else. If it wasn't so serious, this whole debacle could be another scene from "Yes Minister".

John Dods

CAGIT rules ok?

I was browsing through the RA-Aus website recently, specifically the CAGIT trophy section. I was greatly surprised to see that one of the requirements for claiming the trophy was a flight of 100nm each way (at least).

I was unaware this was the case and suspect many members will feel the same. As well as publishing the whereabouts of the trophy, could you please include the requirements?

Kevin McGrath

From the Ed – *Done.*

Fuel throttle

The article 'More fuel you?' by Dave Daniel (Design Notes *Sport Pilot* April 2015) discusses gravity fuel and low wing pump systems for delivering fuel to an aircraft engine.

In the segment subtitled 'Having a gas', Dave raises the problem of vapour formation when using the more volatile Mogas compared to Avgas. The possibility of vapour lock is raised, but that isn't the full story. For gravity feed systems with no fuel pumps, little heat is added to the fuel within fire sleeved lines and most designs can handle the more volatile winter grade Mogas without problems. For pump systems, the extra plumbing and waste heat makes these systems more prone to both vapour lock (insufficient fuel) and fuel percolation (excess fuel). Both these can cause power loss.

The pump system for low wing systems diagram on page 51 shows the electrical pump in series with the engine driven mechanical pump. In this arrangement, fuel flow will help cool both pumps, but an alternative plumbing arrangement is used for some aircraft (e.g the 150hp Beech 23) where the electric boost pump has a parallel line to the mechanical pump which has no cooling shroud.

This parallel line arrangement is even more prone to vapour problems. Even on Avgas, the Be23 would nearly vapour lock on the mechanical pump in hot weather when the electric pump was switched off. The electric pump gave more pressure than the mechanical pump mounted high in the engine bay and would stall the fuel flow through it. This stagnant fuel vaporised in the pump and the fuel pressure would drop to zero for several seconds when the boost pump was turned off until fresh fuel cooled the components. This aircraft tested unsafe for Mogas until cooling modifications were made. An air scoop and scat hose was added, with the scat hose enclosing the fuel line from the fire wall right up to a shroud fitted to the mechanical pump. This arrangement eliminated all vapour lock problems for even the most volatile fuels and an STC for Mogas was granted for this modified system.

During the testing program, an unexpected

problem occurred. Before modification; when changing from Avgas in one tank to a specially brewed volatile Mogas in flight, the engine began losing power. Vapour lock was assumed, but when the boost pump was turned on, the engine lost all power until Avgas was reselected. At full power, the mixture control is set to full rich, but the exhaust gas temperature should rise as vapour lock occurs as the mixture leans off due to insufficient fuel flow. The loss of power was sudden and did not allow EGT readings to be noted, but as the engine began to lose power, the RPM started hunting (a bit like the choke left out in a carburettor engine). This led me to suspect excess fuel and what some automotive engine articles in the late 1970s described as 'fuel percolation'. This can occur when fuel under pressure from the pumps does not boil in the line but does when entering the fuel bowl at atmospheric pressure. A bit like the way an overheated radiator spontaneously boils if the cap is removed. Foam from the boiling fuel in a carby can enter the atmospheric vent and there the surface tension causes the fuel in the bowl to develop a slight excess pressure forcing more fuel through the main jet to the engine. This causes loss of power due to a rich mixture. Black smoke would come from the exhaust but would not be visible to the pilot.

After thinking carefully what would be needed for a pilot to verify and correct any suspected fuel percolation in flight, I reasoned that if the fuel pressure gauge remained in the green arc, then the pumps were delivering adequate fuel. Any power loss would then be because the mixture was too rich. Leaning the mixture knob (even at full throttle) should limit the fuel flow through the main jet to restore full power. This did work but as air flow at higher speeds will cool the components, it becomes necessary to restore rich settings. Not a procedure taught or advised for inexperienced pilots, but it may save the day... and doing the same would also work if a fuel bowl float should ever sink in flight.

A few high wing planes (like the Cessna 177) and some C172 conversions to 180hp do have added fuel pumps. An FAA STC was issued for Mogas for C177 (150hp) models. Interestingly enough, the manual for this aircraft says there is enough gravity feed for it to operate without the boost pump turned on for take-off. It also states should the mechanical pump fail, the gravity feed is still sufficient for safe flight. However, the mechanical pump has no cooling and unlike the Beech 23, C177s have their electric pump also in the engine bay. One owner, who had bought a Mogas STC for his C177, rang me to say it was getting loss of power on take-off in hot weather, so I was able to advise the cause. This confirmed that problems can occur with Mogas in systems which are gravity fed if pumps are present. Possibly the sump tank in C177s delayed enough the onset of vapour problems when switching from Avgas to Mogas during the original testing. For this model, it is safer to have Avgas in one tank for take-off and only use Mogas in cruise.
Ray Hodges

Chuffed to bits

Just thought I would recount an incident several weeks ago which shows there is a very strong airmanship bond between GA and RA-Aus.

I was flying out of Murray Bridge in a Gazelle doing circuits from the right hand seat, as I am working to get my instructor rating. As the main strip (02-20) had a strong crosswind, I was using the cross grass strip for circuits. During this time, a pilot called for the aerobatic box (which runs parallel to the main strip) to be opened. He then proceeded to take off on the main strip well away from my operations. No hassle or problem there. At this time, I was on final and heard the pilot call that he had a rough engine and was heading back to the strip I was on. I immediately told the aerobatic pilot I would do a missed approach, then told him he had the strip to himself because I was out of his way.

I heard ground control tell the pilot he was lucky the grass strip was available. He replied "Thank the Gazelle pilot for quick thinking and getting out of the way".

After landing, I went to see how the aerobatic aircraft was and was promptly taken to one side by none other than Chris Sperou himself. He was the other pilot! He profusely praised me for my airmanship at recognising a potential danger and thanked me for assisting him in removing a potential threat of another aircraft in the circuit.

I was chuffed to bits.

Big thanks to Mike Chapman, Bryan Chapman and the staff at the Murray Bridge Light Aircraft Flying School for teaching me that airmanship is not just about passing exams and practicals but an ongoing learning curve.
Mike Swan

From the Ops Dept - *This is an excellent example of pilot cooperating (regardless of what aircraft type) to ensure safe outcomes for all.*

Tech Facts

I'm afraid I had to sit down after reading the April Tech Talk column by the Tech Manager.

Never have I seen or read such a completely wrong and inaccurate piece of writing from a Tech Manager in over 20 years of membership.

95.55 can never apply to weight shift or powered parachutes as they are specifically excluded under the first paragraph of 95.55.

As a result 3.3 of the Tech Manual can never apply to the construction of a kit or self-build weight shift or powered parachute

The correct advice and the law is that weight shift and powered parachutes which are kit or home built are either under 95.10 or 95.32 depending on what it is and where is it made as a kit.

And just to round off the misinformation the self-build tests under 95.55 are not the same as those in 95.10 or 95.32 so absolutely nothing in the Tech Talk article was factually correct.
Kirk Sutton

From the Tech Manager - *After reviewing in detail your letter and the various CAOs, I offer the following comments to clarify. Prior to 2011 there were no allowances for an amateur built weight shift aircraft under CAO 95.32. Prior to 2011 all amateur built weight shift aircraft were registered as 19 amateur build with Recreational Aviation (AUF).*

The current rules under CAO 95.32 1.4a allows for an amateur built weight shift aircraft. A weight shift aircraft can also be registered under 95.10 as long as requirements listed are complied with.

I welcome and look forward to this growth area within this type of amateur built construction and I value feedback from members to ensure accurate information for readers.

Got something to say?

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.

editor@sportpilot.net.au

(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).

LAST CALL

THIS is the final edition of the hard copy of *Sport Pilot* – unless you subscribe.

From the end of this month, *Sport Pilot* will not automatically be sent to your letter box as it has in the past. Instead it will be available in two formats. You should choose the format best suited to your needs.

The free digital version of *Sport Pilot* will be available on the RA-Aus website about the 10th of each month for download and offline viewing. *Sport Pilot* will also be on ISSUU, a leading magazine website. Why not create an account at www.issuu.com (it's free) and explore the great features for online viewing and sharing.

And as a bonus, it will be published 12 times a year from now on instead of the current 11 times a year. All members will receive an email alert telling them when it is available.

The release of the digital version each month will coincide approximately with the delivery of the hard copies to those members who choose to continue to receive a printed version and who have subscribed.

Printed copies will still be delivered to every flight training facility as a marketing and promotion tool to students and potential new members.

There is a subscription form and self-addressed envelope included with this magazine, so if you want to continue to receive a printed copy, fill it out and return it to the office as soon as possible.

Otherwise make sure the RA-Aus office knows your email address so you can continue to enjoy Australia's most popular and informative aviation magazine every month for free.

BOARD CHANGES

SOUTH Australian board member, Ed Herring, has announced he won't stand for re-election when his term expires in September.

And just as this magazine was going to print, NSW board member, Andrew Saywell, announced he was resigning immediately. His reasons were not made public.

In a letter to his constituents, Ed said that as an RA-Aus Pilot Examiner and Regional Operations Consultant, he could continue to serve the organisation and be of value to the membership. He said some on the board felt a conflict of interest existed when a board member was also a PE or ROC. "This was a contributing factor in my decision to not stand again", he said.

"My time as a board member has been interesting with many challenges. I am very supportive of a change to our constitution which would allow for a smaller and more professional board."

"It should also be noted I am not resigning from my position, I merely won't stand again. This eliminates the constitutional requirement for a bi-election. Until the conclusion of my term, I intend to remain active to serve all our interests."

There will be a bi-election to fill the vacancy left by Andrew.

Andrew Saywell (above) and Ed Herring (right)

PORTABLE HANGAR

Norm Sanders sent in this photo of the latest developments in portable hangars featuring a 60hp Cobram Cobra and 980hp Polish Dromader

FEE CHANGES

BY MICHAEL LINKE **CEO**

RA-AUS is pleased to announce that fees for flying membership will not be increased in the 2015-2016 financial year.

The current adult membership fee will remain at $210. RA-Aus has also aligned the fee structure to make it simpler. This means all adult flying membership fees are now $210. There will no longer be an extra charge for chief flying instructors, senior instructors and instructors. RA-Aus recognises the support of our instructing fraternity with this move.

Junior fees remain unchanged at $165. Non-flying membership fees remain unchanged at $100.

From July 1 the fee to register a two seat aircraft will increase by $5. Similarly the fee to register a single seat aircraft will also increase by $5. The fee to register a powered parachute will decrease from $130 to $70.

From July 1, members wanting a printed copy of *Sport Pilot* will need to subscribe for an annual discounted members' fee of $90 (a $20 discount on the non-member cover price of $110). *Sport Pilot* is being expanded to 12 feature filled editions per year, as well as a companion digital edition available for free to download or view online. Check out the subscription options in this magazine.

BOARD FEE STRATEGY

At a recent meeting of the board, a decision was taken to review our fee structure and put in place a strategy to protect members from large ad hoc increases. As a result, the process will now see fees reviewed annually and compared to changes in the Consumer Price Index. With this information, the board will be able to make informed decisions about future adjustments.

Membership fees have not increased since February 2014 and aircraft registration fees since the middle of 2011. The board recognises the need to keep fees as affordable as possible and, as such, applied a conservative approach to adjustments as noted above. The board and management are also working hard on additional benefits to ensure ongoing value to members.

APPLE WATCH GETS RWY GO

OZRUNWAYS has announced a world-wide app for pilots who want to use an Apple Watch in the cockpit.

RWY Go is designed to complement pilots' iPad-based EFBs or glass cockpits. It displays nearby airports with all the data needed for take-off, landing or emergency diversion.

OzRunways co-founder and RWY Go designer, Rowan Willson says "The Apple Watch's brilliant interface inspired us to create more than just a companion app. Instead, we have launched a powerful tool, both useful and fun to use, for pilots, passengers and aviation enthusiasts."

RWY Go has an algorithm which determines which phase of flight the aircraft is in and chooses the best nearby airport to display. Alternatively users can search for their desired airport by tapping on the runway diagram.

For more information, www.ozrunways.com.

AIRSERVICES SCHOLARSHIPS

FOUR women passionate about pursuing a career in aviation have received financial support from Airservices Australia.

The four pilots won Australian Women Pilots' Association (AWPA) flight training scholarships valued at $8,000.The winners were announced at the AWPA National Conference presentation dinner in Launceston in April.

The scholarships will assist the women with the costs of gaining proficiency at any level of flying.

The winners were Brooke Walsh, Somerville (VIC), Vanessa Whan, Rutherford (NSW), Lucy Simkin, Mooroopna (VIC), Amelia Morton, Bourkelands (NSW).

Amelia Morton, Vanessa Whan, Carol Dehn (AWPA National President), Brooke Walsh, Lucy Simkin.

Subscribe to

SPORT PILOT

Immerse yourself in recreational aviation

Can you afford not to subscribe to Australia's most important aviation publication?

Hurry!

Special Introductory Offer!

18 editions for the price of 12!

To celebrate the changes to Sport Pilot, RA-Aus is offering an exclusive deal to members.

Be one of the first 1,000 to subscribe to *Sport Pilot* for 12 months and receive 18 months for the price of 12.

Don't miss out.

A subscription form and self addressed envelope is included in this edition.

Or see page 4 for how to subscribe.

What's coming in July

* **JABIRU LATEST**
  Critical update for Jabiru owners
* **POWERED PARACHUTES**
  RA-Aus announces major operational changes
* **GET INVOLVED**
  Brian Bigg reintroduces his popular Editor's Choice column
* **INSURANCE**
  Big changes on the way for your aircraft
* **TRAINING**
  New initiatives launched

All this and more in a new look *Sport Pilot* in July

CALL FOR NOMINATIONS

GROUP B financial members are invited to nominate (RA-Aus Constitution Clause 13) for the following board positions:

- South Queensland (No. 1)
- South Queensland (No. 3)
- Victoria (No.1)
- NSW/ACT (No. 2)
- South Australia
- Western Australia

In total, six (6) of the thirteen (13) board members are to be elected at the forthcoming AGM.

Casual vacancy Group A - NSW (No 1). As a result of the resignation of Andy Saywell, RA-Aus has a casual vacancy which requires filling in accordance with Rule 16 of the Constitution. Members are invited to nominate for this position as well.

Nomination forms are on the RA-Aus website. Completed forms and election statements must be received by the Association's Head Office before 5.00pm on Tuesday June 30, 2015.

Candidates shall be entitled to submit an election statement for publication, both on the website and in Sport Pilot magazine, at no cost to the candidate. Statement requirements are set out in By-Law 4. Typewritten statements can either be posted to Head Office or forwarded by email (together with the nomination form) to kelly.stirton@raa.asn.au by 5.00pm EST on Tuesday June 30, 2015.

The statement must include a declaration of all income, remuneration or honoraria deriving from aviation related interests. Such organisations shall include those of sole trader, partnership, unincorporated association, incorporated association or limited liability company. In keeping with the Board's governance role, statements should primarily and specifically address the nominee's expertise and experience of policy and strategy development, implementation and review. Nominees are also asked to provide a recent digital portrait image suitable for publication.

Potential nominees are strongly encouraged to contact the President, Michael Monck, to discuss the strategic direction and governance role played by the board of RA-Aus.

After the close of nominations, all statements shall be printed in the magazine and published on the website in alphabetical order (by surname). Details regarding an election, if required, will be notified to members in due course.

Members are invited to save the date for the AGM, which will be held in Bundaberg on October 11, 2015. More details regarding exact time and venue will be advised shortly.

Michael Linke
Public Officer

For all the information you require to nominate, visit https://www.raa.asn.au/2015-board-nomination-pack

USA FROM ABOVE

IN last month's *Sport Pilot* story 'USA from above' we forgot to include a link to John Gilpin's blog so readers could see the rest of John's story and a lot more photos. Sorry John. To read about the rest of John's travels go to http://jgflyingroadtrip2014.blogspot.com.au/

Seeing USA from above

BY JOHN GILPIN

I've long wanted to fly the high desert areas in the western US. The scenery is spectacular.

High mountains, deep canyons, volcanoes, lava flows, dramatic rock formations, everywhere. And because this is dry desert country, there are no trees to hide the view. You'll see lots of rocks, I'm also interested in water supply, power generation, agriculture, commerce and transport, all of which the Americans do in a big way.

While still in Australia, I searched maps and the internet for points of interest and plotted them on a Google Map. Then I scanned the aviation Sectional Charts for quiet airfields in the areas I wanted to fly and plotted them on the map. By zooming in I could see what the airfield actually looked like, amazing!

When in the US if I wanted to fly a particular feature, I just selected the nearest likely airfield and set up there. I mostly tried to use unattended fields and there are lots of unattended, run-down airfields these days. Some were open access, just drive in. Some were surrounded by chain-link fences with locked gates. I had to call the manager to get the pin code or sometimes find the local sheriff to gain entry. These quiet airfields were also excellent places to camp. Usually with toilets, sometimes a pilot's lounge, and pretty safe, because vandals mostly stay away from airfields. I usually had the place all to myself. It was all fairly convenient and worked really well.

This sort of ultralight flying is nothing like the typical Sunday morning flight around the home patch, flying just for the thrill of it. I used the aircraft as an observation platform, for viewing and photographing what I saw on the ground. I like to call my aircraft my 'high-clearance off-road vehicle'. I usually identified features I wanted to investigate, whether geographical or man-made, from maps or internet, then used the aircraft to get a unique perspective on them. Travelling by road only gives you a flat roadside view. From 1,000ft above, that same view becomes spectacular!

The Kolb is particularly suited for such observation, because sitting right in front gave me an unparalleled 270 degree vista. It flies slowly and is very stable even when hands-off the controls, which gave me time to concentrate on composing the image in the viewfinder.

Every pilot at all times should watch out for where he/she would land if the engine should quit, but very few really do that because modern aircraft engines, especially when maintained by a professional mechanic, are so reliable and sitting in a solid, comfortable cockpit gives you a feeling of security. I don't get the same feeling when sitting out in front of a buzzing 2-stroke, maintained by myself. If the noise does stop, the aircraft glides really well and lands fairly short, but my feet are the first to

GM streams live

BY BRIAN BIGG

FOR the first time in May, RA-Aus members anywhere in the world had the opportunity to attend a General Meeting without leaving home.

The meeting itself was held in the club rooms of the Hunter Recreational Flying Club in Pokolbin in NSW and appeared to be well attended.

But for those of us whose who couldn't be there in person (the weather in northern NSW was so bad that weekend it made the news), RA-Aus streamed the meeting live on the web.

It was great to be able to see and hear what was going on at the meeting and get all the latest information from the board, even though we web watchers obviously missed out on the lunch afterwards.

It was also frustrating to be able to see and hear what was going on, but not contribute. I texted Dexter Burkill (who I could see from the picture was there in person) and asked him if he would be willing to stand up and ask or answer a question for me, which he did.

CEO Michael Linke tells me a facility to allow web viewers to contribute questions and answers may be added to the live stream in time for the next General Meeting. This will allow the entire membership to contribute.

Michael says it was disappointing so few logged on to the meeting (three people in Saudi Arabia?), but a big effort will be made next time to let everyone know it will be available. Members often complain about not getting an opportunity to attend meetings and ask questions of the board. This was a great opportunity to do so and everyone should try it next time.

By the way, the recording of the General meeting is on YouTube for you.

https://www.youtube.com/channel/UC9uoVI-UeTwNC6FiD4_QIzQA/videos

STREAMING GM STATISTICS

User location
27 Apr 2015 - 03 May 2015

Region	Downloads	%
Australia	132	94.3
United States	4	2.9
Saudi Arabia	3	2.1
New Zealand	1	0.7

User operating system
27 Apr 2015 - 03 May 2015

Operating system	Downloads	%
Windows	90	64.3
Mac OS	35	25
iOS 8 (iPad)	8	5.7
iOS 8 (iPhone)	3	2.1
Mac OS X	2	1.4

Total streaming overview
27 Apr 2015 - 03 May 2015

Total # of viewers:	140
Total # of unique viewers:	59
Average view duration:	0h 12m 25s
Data streamed:	9.6 GB
of which is mobile data:	1.9 GB

web streaming the meeting

Better times ahead

A LOOK AT THE FINANCIAL REPORT PRESENTED TO THE GENERAL MEETING IN MAY

BY JIM TATLOCK
TREASURER

THIS report outlines our financial results for the first nine months of the financial year.

Overall we have generated $128k (7.5%) more revenue than budgeted. We incurred expenditure of $27k (1.5%) more than budgeted.

We continue to improve our budget position, especially in our expenditure. Overall, we are ahead of our budgeted position by $101k (projected deficit $230k, actual $129k. This figure may be overstated as we continue to carry an unpaid invoice from CASA for $50k, although once Deed negotiations are concluded, these funds will flow to us. We have received our credit from the ATO ($33k) and we are in the process of moving funds from the Profit and Loss to the balance sheet as a result of the modernisation project.

It is anticipated our financial tracking will continue in line with our first nine months operation. If this is the case, we are on track to report a loss of around $200,000 - $200,000 ahead of budget. Planned structural changes to the way we do business in 2015/16 will further reduce our budget deficit position and turn it into a surplus (see budget paper recently submitted to the board 20150503-2.2.2). These changes include our modernisation project, revised *Sport Pilot* delivery method and revised aircraft registration fees.

INCOME

Membership fees and aircraft registrations remain strong, with solid increases totalling $119,000 compared to budget and $76,000 compared to the same period last year. We noted an increase in March for member renewals/new students and our aircraft registrations are higher in the first quarter (Jan to March) than last quarter (Oct to Dec).

Looking individually at actual membership renewals, we are seeing a slight decline year on year, although March 2015 showed a small increase (8.6% new students 3.1% renewals). We have recorded about 50 fewer new students in the eight months, compared to the same period last year and about 170 fewer renewals during this same period.

This represents about a 3% decline, which could either be ebbs and flows in member numbers or a slow erosion of our membership base. We need to continue to correct our errors of the past before we commence strategically marketing to attract new members. I would expect to ramp up major membership recruitment once we have delivered the new *Sport Pilot* and delivered our modernisation project. We also have our new constitution to be delivered this year. These three projects will set us up for growth and expansion as we attract new demographics to our sport.

EXPENDITURE

Overall expenditure is 1.4% more than budgeted. We have clawed back some items in recent months and this result is a pleasing one.

RISKS

CASA funding: Lack of funds from CASA will drag into the second half of the year, which will aid cash flow once the agreement is signed, but it does require attention in the next financial year to ensure external commitments are made to us on time.

We have raised this matter as a serious issue with CASA and have received a draft Deed of Agreement, however the Deed is not suitable and needs some editing.

Higher standards

BY TONY KING **SECRETARY**

I'M pleased to report the secretarial functions and record keeping of RA-Aus are being performed to a higher standard than ever, thanks to the team in our office. However the information management systems and processes in use at RA-Aus today have changed very little over the past 10 years, despite considerable growth of the organisation (and the resulting workload) and significant advances in technology.

As a result there are many opportunities for improvement.

At its October 2014 meeting, the board approved funding for a scoping study to develop a plan for the modernisation of the systems which support the core functions of RA-Aus. Following successful completion of the study, the CEO presented the board with a proposal for a Systems Modernisation project, to be funded from capital reserves and completed in calendar 2015.

The board approved funding for this project in March and instructed the CEO to form a steering committee to oversee the project.

Successful completion of the Systems Modernisation project will deliver a quantum leap in the quality and accessibility of information within RA-Aus, yielding benefits to members (e.g. online self service for a range of transactions) at the same time as substantial savings to the organisation.

The Constitution also requires the Secretary to "Ensure all board resolutions are published within seven days in the Members Only Section of the RA-Aus website, with the report to include how each board member voted and the resolution summarised only where it is essential to protect reasonable confidentiality".

A small number of resolutions have been voted by the board since the October board meeting. These have all been published on the RA-Aus website, including the voting record.

The Constitution requires the Secretary to "At the direction of the board, conduct a plebiscite of the members in respect of a matter of policy....". The board has issued no such direction since its last meeting in October 2014.

The Constitution requires the Secretary to "Ensure that once received, the annual reports of the President, Secretary and Treasurer and the audited annual financial statements are provided to the members in accordance with Rule 21". This provision in the Constitution is not relevant to the period since the last board meeting (in October 2014) as the annual reports fall due prior to the AGM.

In addition to the Constitutional requirements, as Secretary I have actively participated in the work of the board and the executive. The board meets online (by means of the board forum) whenever items of consequence need to be discussed. The executive meets formally (via teleconference) with the CEO on a monthly basis. These meetings are minuted and the minutes distributed to the board within a few days of each meeting.

RA-Aus has a good team in place at the office, ably led by the CEO, and a board which is working well.

Issues of the past continue to haunt us, but they are no longer crippling us and we are moving forward to secure the future of RA-Aus as the leader in recreational aviation.

Strategic plan

AT the General Meeting in May, the RA-Aus board officially released its latest strategic plan.

It's all based around Safe, Accessible, Fun, Enjoyable aviation (SAFE aviation).

Strategies were arrived at following a consultative process held between November 2014 and February 2015 involving staff, leaders, board members and stakeholders. Further review and refinement will take place in October 2015.

OUR MISSION

Accessible, safe aviation for all, by being an industry leader in developing sport and recreational aviation for the fun and enjoyment of our members.

OUR CORNERSTONES

- **Members -** Our members are central to everything we do. We will encourage a safe, learning, transparent and engaging relationship with all of them.
- **Promotion -** We will promote our brand as a leader in the sport aviation sector.
- **Alliances -** We will forge alliances based on mutual trust and respect with people and organisations from both within and outside our sector.
- **Governance -** We will govern our organisation with a focus on safety, integrity, transparency and solidarity.
- **Modernisation -** We will use modern technologies to aid in developing robust reporting mechanisms, coupled with innovative techniques to engage with our members at all levels.

These strategic themes will allow us to be a lean and effective organisation with a commitment to safety, a strong performance based culture, a commitment to serving our customers, ability to generate additional revenues needed and a skill set to educate and inform the community at large.

CORPORATE VALUES

We will continue to adhere to our corporate values, which are:

- Safety above all else
- Integrity in all of our dealings and decisions
- Respect for others
- Self-responsibility
- Organisational unity
- Professionalism
- Enthusiasm for our movement, and
- Continuous improvement.

We need to focus on the issues in front of us by working together in a mature and pragmatic way.

We face increased demand and expectation from our clients. We need to deliver high quality services centred on putting members first. We are robust and resilient, we will face challenges in a united way and do everything we can to protect our members and our movement.

A number of issues will affect RA-Aus in the coming two to five years.

2015-2016 – THE YEAR OF CHANGE

The following strategic issues have been identified as being critical to our ongoing success over the next year. Delivering the projects below will establish RA-Aus as the pre-eminent member based aviation body in Australia and lay the ground work for future success.

ORGANISATIONAL - GOVERNING

Constitutional Reform - We are currently operating with an outdated constitution which does not meet the needs of our association any more. This cornerstone document needs review and is the highest of our priorities in 2015.

Jan 15 – May 15: Consult with members and draft new constitution.
May 15 – June 15: Review draft constitution with professional advisers to ensure equality of members, fairness of treatment, legality of clauses, etc.
June 15 – Sept 15: Put draft up for consideration by members.
Oct 15: Vote on adoption of new constitution.
Oct 15 onwards: Draft plan for execution subject to approval by membership.
Policy Development - Our future success will be in having a robust policy framework. This framework will exist at two levels: one at the board level, the second at a management level. Policy development work is ongoing with new and existing policies requiring review every 12 months.

New policy development will see a timetable of creating one new management policy per month taken from the policy bank and seeing policies developed in accordance with management priorities.

Board policies will be developed in accordance with the constitutional reform agenda.
Process Improvement - Coupled with our policy development will be a robust internal process improvement process.
July 15 – June 16: Review and rewrite of the administration manual.
Jan 16 – June 16: Organisational review. After implementation of our modernisation project we will undertake an organisational review to realign resources with our modern working environment.

ORGANISATIONAL - MANAGING

Safety Management - We will progressively deliver improved safety outcomes through a holistic approach to safety management, adopting an open and fair reporting culture.
July 15 – Dec 15: As part of our modernisation project we will deliver an occurrence management system to manage safety both at a granular level as well as management reporting level.
Jan 16 – Jun 16: We will implement our SMS.
July 15 – June 16: Working cooperatively with our members we will set out to ensure all occurrences involving members and aircraft are captured, reported, reviewed and an outcome determined.
Member Education - Educating members is critical to our theme of making them central to everything we do. We care about our member's safety and will continue to develop a no blame culture to ensure we learn from their experiences and share this learning with all members.

We will commit the necessary resources to deliver a raft of training solutions for our members in accordance with the following targets.
July 15 – Dec 15: Work with appropriate education partners to develop curriculum, learning materials, assessment tools and management reports.
Jan 16 – June 16: Commence roll out of training courses. Priority one training course is an L1 training course. Following successful delivery of this training course we will deliver three further courses including: L2, safety management and instructor training.

As part of this roll out we will also develop an evaluation program to ensure our training remains relevant and up to date.
Endorsements - To ensure we maintain the privileges of our members and to combat the potential erosion by Part 61 (RPL), we will vigorously pursue a number of endorsements for members;
July 15 – Oct 15: Development of the Ultralight Pilot Certificate;
July 15 – June 16: Progress the development of the necessary protocols to create endorsements for access to CTA by members;
July 15 – June 16: Progress the development of the necessary protocols to create endorsements for access to increased weight aircraft by members.
Influencing Others - We all believe we have a unique opportunity to influence others and we are committed to using our time at RA-Aus and our interactions with other community members to ensure we deliver positive, truthful statements about the work we do. Every interaction is an opportunity to influence. We don't judge people, we influence them.
July 15 – June 16: We will influence our members by regular attendance at fly-ins and air shows. We plan on attending 12 events per year.
July 15 – June 16: We will host two events to showcase RA-Aus, our members and supporters.
July 15 – June 16: We will host a joint sport aviation conference.
July 15 – June 16: We will deliver professional development training for members.
July 15 – June 16: We will host an RSO conference.
July 15 – June 16: We will host a CFI conference.
July 15 – June 16: We will meet with and engage with key stakeholders including CASA, ATSB and Airservices.
Public Awareness - By increasing the awareness of the public through a range of channels (personal interaction, attendance at fly-ins, social media etc) we will continue to grow our movement. Issues are often more far reaching than day-to-day flying and we should attempt to educate the community on other core issues such as airmanship, maintenance, risk assessment, hazard mitigation and incident reporting.
July 15 – June 16: Social media: We will have a following of more than 10,000 people.
July 15 – June 16: Social media: We will post positive stories about RA-Aus on our social media platforms twice a week.
July 15 – June 16: Traditional media: we will exploit opportunities to promote RA-Aus to the general public as opportunities arise.
Staff Education - Only through a well-educated staff can we hope to improve our skills and outcomes for members. We are committed to providing staff with relevant training in line with their roles and responsibilities.
July 15 – June 16: All staff will attend four development training sessions with a focus on customer service, communication, leadership development and technical skilling.
July 15 – June 16: Key staff and volunteers will have access to ATSB based training as the opportunities arise.
Greater Industry Acceptance/Respect - Review and enhance our operations and technical information to provide our members, stakeholders and the industry with the confidence they require in operating aircraft registered with us.
July 15 – Dec 15: We will deliver a new Technical Manual.
July 15 – June 16: We will deliver a revision to our Operations Manual V7.

REGULATORY

Part 149 CASR - The introduction of this part will change the landscape for sport aviation in Australia. We need to be agile enough to ensure we are ready for its introduction.
UAVs/Drones - We will undertake a review of this sector of aviation with a view to informing ourselves as to what role RA-Aus could play.

Lake Barambah creates a splash again

BY DEB PERCY

ANZAC Day provided perfect flying weather for the second Burnett Flyers Fly-In Splash-In.

This year the event was held at a private airfield on the shores of Lake Barambah. The event was attended by RA-Aus pilots as well as GA enthusiasts. Aircraft came from as far away as Sydney.

Members of the Seaplane Captain's Association attended in a variety of amphibious aircraft, the biggest of which was the Grumman Mallard powered by two 600hp Pratt and Whitney radial engines, the only one left in original condition in Australia.

More than 100 people enjoyed the country atmosphere with a portable kitchen being brought in to serve meals. Saturday night's camp oven meal was baked in recycled truck brake drums. The menu included roast venison (donated by property owner, Paul Markwell) pork and chicken, plus dessert. Three large bonfires countered the cool evening and participants moved around to listen and participate with club flying instructor, Bill Grieve, well known for his flying quizzes to promote safety.

"A highlight was a ride in the Mallard"

Two large marquees were donated by BP Reliance in Wondai and were full to overflowing.

A highlight of the weekend was a ride in the Mallard which took five lucky winners over the lake for a 30 minute scenic flight. Sunday morning saw the Mallard return to Brisbane with me in the co-pilot's seat. I returned in another Grumman, a high performance all weather rated Tiger, owned by one of the club members.

Windy weather on Sunday forced some of the participants to stay over an extra night and leave Monday at first light. The campfire and meals made it an enjoyable extension. The Burnett Flyers has established a reputation for providing a service for aviation in the region. This not-for-profit club provides a fly in breakfast every second Saturday of the month.

Club President, Ralph Percy, noted the Flyers has a great team who give their time freely to help with valuable airfield projects, which gives the community a vital link to the outside world in emergency situations and who can provide aircraft if needed on short notice.

More information on the club can be found at burnettflyers.org.

Directing traffic

Mallard making a showy entrance

Poetry around the campfire

Buccaneer pulling up on the shore

Everyone loves Loxton

BY GLEN GRAY

THE Loxton Biennial fly-in was a huge success again this year.

Although the weather tried to put a stop to our plans, pilots played it safe. Many waited out Friday on the ground and flew in on Saturday morning. A lot more chose to come by car just so they didn't miss out.

Saturday morning proved to be busy. About 40 aircraft made a dash for YLOX midmorning, which kept the ground marshals busy.

The Tiger Moth entourage arrived in formation (of course) to start the day off. These guys have been coming to our fly-ins for the past 10 years. Together with their flying skills and impeccably prepared aircraft, they epitomise what aviation is all about.

Just as we thought things had quietened down, two parachutists dropped in on the front lawn of the clubhouse. They added to the excitement of the day and did some tandem jumps while they were here.

This year we arranged to have workshops throughout the day, which proved to be popular.

Our focus this year was Women in Aviation and we had the President of AWPA, Barbara Parish, share her experiences and wealth of knowledge.

CASA's Kevin Scrimshaw and Terry Horsam held two sessions on weather and ramp checks. These were well attended and there was healthy discussion.

The hangar was packed when Howard Hendrick (WW2 Lancaster Pilot) shared more of his experiences. Howard is always a huge drawcard. Some people reported they had come to the fly-in just to hear him speak.

RA-Aus' Michael Linke and Michael Monck also attended and gave a rundown on the present and future of the organisation.

Judges couldn't get past the beautifully presented RV6A (VH-PHR) owned and flown by Peter Harkness from Mount Gambier. Peter's aircraft was judged Best Aircraft.

Once again, Simon Treloar took away the prize for furthest distance flown. Simon does it tough coming from Newcastle in a trike. He and his trike group from many and varied destinations managed to get as close as Swan Hill before the weather got them and they had to hire two cars to get the rest of the way. How's that for commitment? As I write this, Simon is sitting in Orange waiting for a break in the weather to return home.

This year our chosen charity was Angel Flight. A group of Angel pilots attend each fly-in and give a short talk on the organisation. We were able to present them with a substantial sum of money we raised from a raffle.

The hangar dinner was another highlight. The meal was provided by member, Rod Hondow, who raised the benchmark once again and satisfied 200 people with a memorable bush banquet.

During the dinner, speaker Marion McCall absolutely wowed the audience. She held the audience spellbound for an hour detailing her experiences learning to fly at the age of 50. She was totally honest about the difficulties she encountered during the journey to a logbook with 1,700 hours in it.

All in all, this was our best fly-in yet. We are currently working on a date for 2017. Stay tuned.


Most flew in Saturday


The morning was busy


The perfect get away


The workshops were popular


Howard Hendrick is a treasure


A satisfying repast


Peter Harkness' Best Aircraft winner

Australian Government
Civil Aviation Safety Authority

SO YOU'VE HAD A CLOSE CALL?

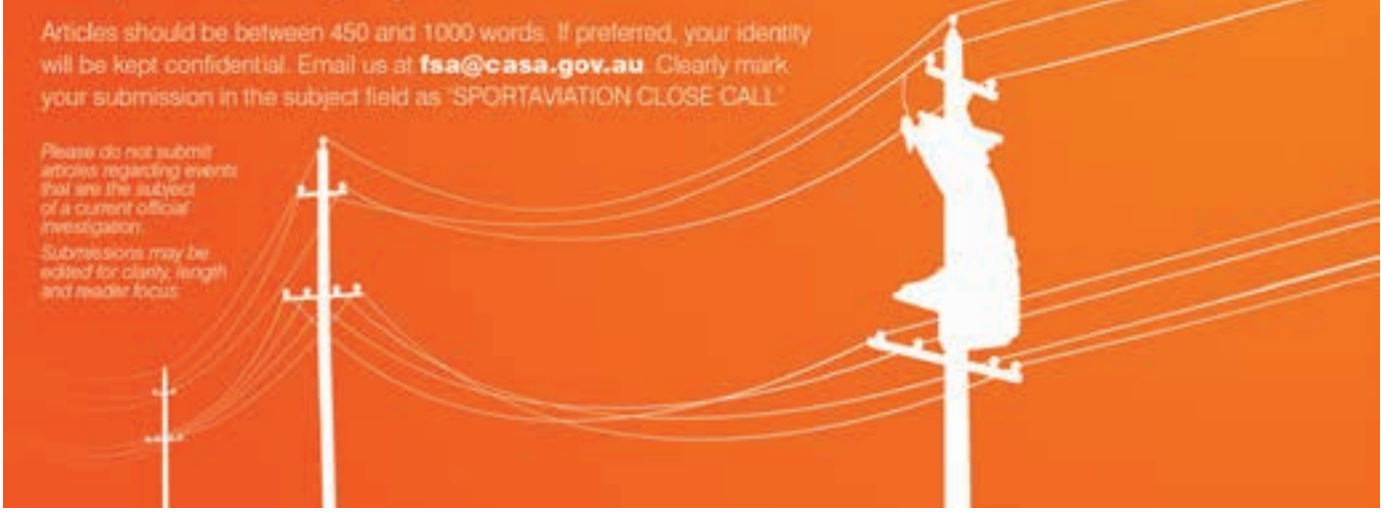
Often the experience is something you'll never forget and you have learned from it.

Why not share your story so that others can learn from it too?
If we publish it, we'll give you **$500**.

Articles should be between 450 and 1000 words. If preferred, your identity will be kept confidential. Email us at **fsa@casa.gov.au**. Clearly mark your submission in the subject field as "SPORTAVIATION CLOSE CALL".

Please do not submit articles regarding events that are the subject of a current official investigation.

Submissions may be edited for clarity, length and reader focus.



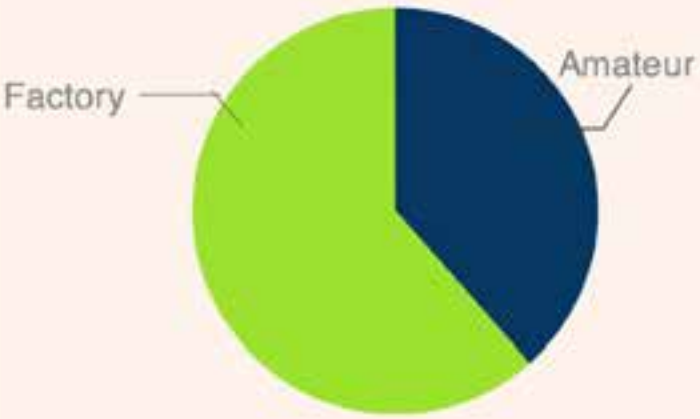
RA-Aus

Tech Team 730 hourly (or monthly edition)

Tech were asked the question about how many aircraft types Recreational Aviation Australia has registered. We enquired around the office for some guesses and the majority of responses were in the region of 100-200 different types. Over the following days it was calculated that 5365 aircraft had been registered since 1983. Incorporating all the Amateur Builts as different types, Recreational Aviation Australia has registered over 500 different types.

The BREAKDOWN

Factory Built vs Amateur Built



The Aircraft Register

Quick facts

RA-Aus is the 3rd largest aviation organisation in Australia

5365	500+	3280
Total recognised aircraft registrations since 1983	**Types** J160,170 and P92 represent 3 types	**Current** registered RA-Aus aircraft

DOMINATES

Three axis aircraft have dominated the register covering 82%. The remaining 18% is made up of trikes and powered parachutes.

82%

Three Axis Aircraft on the register

MOST POPULAR

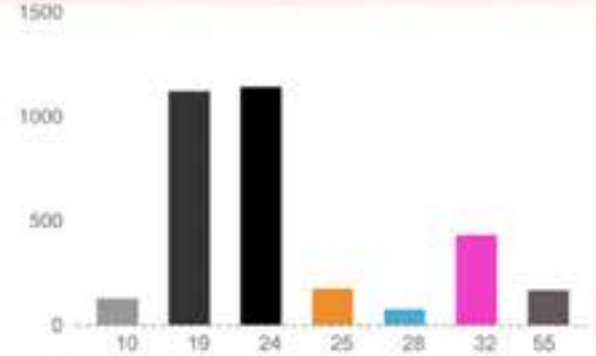
Jabiru represents 17% of Recreational Aviation's registrations over the past 30 years making it our most popular aircraft.

17%

Historical Jabiru Registrations

Aircraft Categories

Breakdown of the 7 registration categories (current registrations)



19 AND 24 REGISTRATIONS ARE NECK AND NECK

Arriving into Wynyard

The Tale of the Single Engine Twins

Kreisha Ballantyne interviews the always entertaining twin sisters, Lesleigh Griffin and Billie Hicks, at Devonport Aero Club in Tasmania. Owners of a Pioneer Hawk, they chat about their partnership as aviatrixes.

BY KREISHA BALLANTYNE

What inspired you both to learn to fly? Was aviation part of your childhood?

Lesleigh: it was the TV series 'Star Trek' which first inspired me. Then in my early 20's, the theory of flight captured my imagination, with the actual flying side of it soon following.

Billie: It was my darling sister, Lesleigh – finding myself sitting in the right hand seat of a Cherokee Six on a flying safari to Central Australia, which she planned and flew. Can you imagine a Cherokee Six filled with five young gorgeous women? Needless to say we had a very good time. I will tell you a little story – we were in Alice Springs, Les was flight planning and the rest of us were chatting up some US Airforce personnel. These guys were heading to Darwin in a Starlifter Galaxy and the captain invited us to come along. The offer was also extended to the Cherokee Six. We all said yes but when Les came back she said no. What was she thinking?! All she wanted to do was fly us to Uluru and that was that.

When did you learn to fly?

Lesleigh: I obtained my CPL in 1978, Instructor rating in 1981 at Moorabbin and Recreational Aviation Certificate in 2000 at Smithton, Tasmania.

Billie: I obtained my Private licence in 1978 at Moorabbin and my Recreational Aviation Certificate in 1988 with an Instructor rating in 1989.

Tell us about your time in aviation; the aircraft you've flown and the places you've been.

Lesleigh: While living in Melbourne, I flew out of Moorabbin and instructed out of Essendon. Then when I moved to Brisbane, I flew out of Redcliffe and Archerfield. I have flown all the Piper range up to Navajo, all the single engine Cessnas (except the Caravan) and 180, Beechcraft Duchess, Bonanza Skipper, Grumman Tiger and Cheetah and a Trinidad Socata, just to name a few.

Billie: I flew out of Moorabbin, Essendon, Point Cook and Laverton. My ex and I had our Drifter in one of the RAAF hangars (Laverton) and had the privilege of using that airfield on weekends rather exclusively. My favourite aircraft to fly was a Beechcraft Bonanza. I have flown most of the single engine Piper range (from 140 through to the Lance), Cessna 150, 152, 172, 182, Beechcraft Bonanzas and the Skipper, Decathlons, Grumman Tiger and Cheetah.

Is the Pioneer your first aircraft you've owned?

Lesleigh: No, that privilege goes to the LightWing and what a wonderful handful she was. Someone once said to me ''don't relax until it is safely in the hangar'' – how true. My second love affair with owning an aircraft is with the Pioneer Hawk 300.

Billie: The Pioneer is my third aircraft. The first was a Drifter (partnered with my ex-husband) and the second was a LightWing (three way syndicate – one of them being Lesleigh).

Sharing the pre-flight duties

Pebbles was a handful


Lesleigh, Kreisha and Billie

What made you choose the Pioneer? Tell us what you love about it.

Billie: We both did a test flight in the Pioneer and independently decided this was the one – it flies like a dream and can take the rough stuff in its stride. Crosswind landings are a piece of cake. The Italians not only make amazing cars and motor bikes – add this aircraft to the list.

If you could add anything to the Pioneer, what would it be?

Lesleigh: A gorgeous male co-pilot! I get tired of looking at Billie. But seriously I would like more luggage room.

Billie: The colour pink (I am partial to pink) and better inflight entertainment because Lesleigh can't sing to save herself.

Did you consider any other aircraft; was there a shortlist?

Billie: We looked at many over an 18-month period, both high and low wing, tricycle and tailwheel etc. When we flew the Pioneer, we were both hooked. Our aviation background was predominantly in low wings so it was an easy decision.

What's your flying profile now – where do you go?

Lesleigh: Mostly within Tassie and its surrounding Islands. We are active members of the Wynyard Aero Club and participant in many fly-aways and commemorative events (Battle of Britain and ANZAC). The club is planning a number of trips to the big island north of us, so see you soon.

Do you have different strengths as pilots? Different interests in aviation?

Billie: We love the competition between the two of us, basically who can do it better - the landings, the radio (Les always wins this one – just ask her). Lesleigh's background is in training so she is constantly looking for ways to improve her skills and mine (unfortunately).

Do you ever disagree in the cockpit, and if so, how do you solve your issues?

Lesleigh: Yes we have had a few tense moments with each other over the years, but we are still flying buddies and can now laugh about most things except the time when...

Billie: I was in command on a landing into Kangaroo Island with only a few hours on type (Cherokee Lance). Les was my co-pilot. It was a rough day with the wind all over the show and one missed approach got Les feeling a little nervous. As a consequence, Lesleigh had to sit down the back on my next leg –that shut her up, sadly only temporarily.

What advice would you give to others looking to purchase an aircraft as a partnership?

Both: Know and respect the others in the partnership, understand each other's aviation needs, document the partnership agreement in particular the 'what happens if' scenarios, be flexible, pay as you fly (agree on an hourly rate) and agree up front to a minimum specified period of ownership.

Miracles do happen

Big and small posing together

BY NORMAN NICHOLLS

WHEN I recently learned a Qantas 747-400 had landed at Illawarra Regional Airport at Albion Park, south of Wollongong, NSW, I found it very hard to believe.

I am familiar with the picturesque airfield and I know the airport only has runways designed to accommodate light aircraft, not an aircraft the size of a 747-400.

But I was wrong to be sceptical and when I saw the video footage of the jumbo landing there, I was amazed and immediately decided to fly down in the Jabiru to see it for myself.

John Taru, instructor at the Oaks Flying School, and I made the flight together. It was a beautiful day, nil wind and a bright overcast - perfect for flying and the photography I had planned.

Because there was no wind, we decided to land from the north on runway 16, just as the 747 had done. We made a gradual descent and came over the Illawarra Escarpment. There dead ahead was runway 16 waiting for us. We touched down then taxied to where VH-OJA 'City of Canberra' was parked. With kind permission, we parked our Jabiru in front of it.

We learned that the City of Canberra landing at Albion has such a story behind it.

Four senior Qantas captains spent more than 25 hours in the simulator to prepare for the delicate and tight landing. Captain Matthews was in command and all four captains had chalked up over 50,000hrs between them. They also had flown over AP in light aircraft to get a feel for the airport before bringing in the 'City of Canberra'.

The runway at Albion Park is 1.8km, a lot shorter than Sydney (4 km). The 747 weighs in at 360 tonnes and they were worried the weight could damage the runway. So the aircraft tyres were pumped down to 120psi from the normal pressure of 208psi. The 747's normal landing speed is around 180kts, but to land at AP they had to fly at 132kts (our Jabiru puts down around 70kts).

Historic first

The 'City of Canberra' made the record books in 1989 for the longest non-stop flight from London to Sydney (20 hours, 9 minutes and 5 secs). It has now been retired after 25 years of service and has been donated by Qantas to the HARS (Historical Aircraft Restoration Society) museum at AP instead of going to the aircraft graveyard in Arizona. The museum is also home to the largest collection of both flying and static aircraft in Australia. It even has a Qantas Lockheed Constellation, restored from the Arizona scrapyard and flown back to Australia some years ago.

After having had a great time at AP and photographing our Jabiru as it posed happily beside the 'City of Canberra', we flew home to the Oaks.

I still think it is nothing short of a miracle the 747-400 was able to land safely at AP – but, of course, miracles do happen.

Syncro-nicity

BY GREG DOYLE

SYNCHRONISM is defined as "the representation in a work of art of one or more incidents which occurred at separate times".

This sums up the new Syncro, a blending of the highest levels of aesthetics and ergonomics, in a new approach to a high speed sport aircraft, computer designed and manufactured by the Fly Synthesis team. Italian flair and passion and 25 years of experience in carbon fibre aircraft manufacture show in its lines.

Australians are very familiar with Fly Synthesis, which was established in the 1980's and became well known for its first model, Storch a composite built rag and tube replacement. The company continued that success with the Storch S, the Texan and the Texan 2 and, more recently, the Wallaby 582 and Catalina seaplane.

The new Syncro maintains the well-known Fly Synthesis aircraft characteristics, with state-of-the-art 100% carbon fibre construction for lightness and airframe strength.

It has outstanding all round visibility and a new approach to door design and size. The doors allow simple access to a very comfortable cockpit. There's also a modern design for seating with 3 axis hydraulic adjustment.

Technically the Syncro is at the leading edge of current LSA designs. Its high efficiency, blended profile carbon fibre wing incorporates four individual profiles and drag reducing upturned wing tips.

The aircraft has a 10.4m span wing, with an area of 10.54m2. This, with a high penetration fuselage nose and the strut-less wing support, enables a 20:1 glide ratio for safety with significantly improved fuel economy. While maintaining a low stall speed, the design allows a cruise speed of more than 130kts.

The Syncro, as developed for Australian conditions, has 135 litre fuel capacity, which means a range of around 1,500kms is possible. Two luggage doors give easy access to a 40kg luggage compartment.

The Syncro advances Fly Synthesis' reputation for style and finish in a package with excellent manoeuvrability, long range, proven durability and value.

For more information, www.silentwingsaviation.com.

A high speed sport aircraft

Computer designed

Italian flair

"The Syncro maintains well-known Fly Synthesis characteristics"

Drag reducing upturned wing tips

A 20:1 glide ratio

A new approach to door design

we've got you covered

ALISPORT
www.alisport.com

Composite DU Class Gliders, Self Launch gliders and DU glider fast build kits

COLYAER
www.colyaer.com

Fully composite, wet wing LSA seaplanes and tri-gear aircraft that soar at >20:1.

AEROPILOT
www.aeropilotcz.com

Carbon fibre LSA and UL aircraft identical to 80% scale of a very popular GA aircraft

Innovation through FK9 diesel engines, the **award winner** from AERO 2014. This year's AERO 2015's Best Aircraft, the Legend 540/600.

The aircraft in this range compliment each other and are available as Tri-gear, taildragger, floatplane and seaplane configurations in ready to fly and kit versions. Local stock is held and all aircraft can be delivered ex Works as custom built to your requirements. Professional support is provided in Aust/NZ and selected Asian countries.

silentwingsaviation.com

EAST COAST OFFICE (02) 43 6930 43 | 0400 114 747 WEST COAST OFFICE 0409 962 050 | 0400 291 172

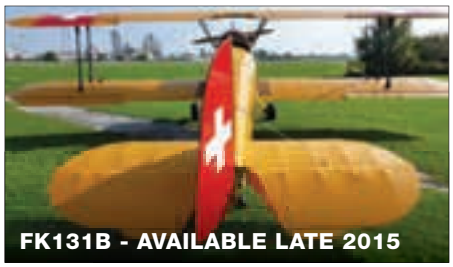
silent wings

Look no further for an outstanding range of factory built and kit aircraft, from our proven European manufacturers. Select from our 'best of breed' range.

BÜCKER & FUNK
www.bueckerundfunk.de

FK131A

FK-Lightplanes designer and specialised custom Vintage reproduction manufacture


FK131B - AVAILABLE LATE 2015

WINNER AERO 2014 BEST DIESEL


STORCH AMPHIB


CZ AMPHIB FLOATS

FK-LIGHTPLANES
www.fk-lightplanes.com


FK(SW)51 MUSTANG

Reproduction LSA warbirds, aerobatic biplanes, high speed cruisers and Trainers


FK14 LE MANS CONVERTIBLE


FK9WB - AWARD WINNING DIESEL


FK9 AMPHIB


FK12 CONVERTIBLE

FLY SYNTHESIS
www.flysynthesis.com


SYNCRO

Carbon Fibre LSA aircraft and fast build E-LSA kit planes for every budget


STORCH S


TEXAN TC


CATALINA AMPHIB


WALLABY 582

The search for Number 1

BY JARED SMITH

ASSISTANT OPS MANAGER

I NEED your help.

The large variety of aircraft on the RA-Aus register is typical of our members' ingenuity and unique interests. We've found that over the years, there have been more than 500 types of aircraft registered with RA-Aus. A total of 5,365 aircraft all told.

I am fascinated by the achievements of our members who've been building aircraft from scratch with expert precision and care. I wanted to explore the history further and set out to locate the aircraft which was the first registered by RA-Aus.

It was logical to think 10-0001 would have been the first.

10-0001 is a Kestrel Kermit and yes, it is green. The aircraft now resides at the Queensland Air Museum. 10-0001 first flew in 1999 with a Rotax 503 and Sweetapple 2 blade propeller. The Kermit weighed in at 172kg empty, stalled at 39kts and cruised at around 52kts.

In February 2014, the Kermit was donated to the Queensland Air Museum with approximately 400 flying hours on the dial.

To my surprise, this particular aircraft was not actually registered in 1983 but had its number allocated in 1995. So it wasn't the first!

RA-Aus underwent a database upgrade in the early 2000's and the export of information has made it difficult for me to ascertain the first aircraft registered, although I suspect it to be a Thruster. The search continues...

If you know the history of the earliest registered aircraft in our fleet, email editor@sportpilot.net.au and let us know (photos if you have them) .

Owning your own

BY TONY PETERS **GIPPSLAND FLIGHT CENTRE**

AS an owner and operator of a CASA and RA-Aus flying school, and with over 50 years in the industry, I have heard many pilots say "I'd love to own an aircraft".

Indeed it is possible to do so, but there are things which need to be addressed for it to happen.

First you have to look at what you want to do in aviation in the long run, where you would like your flying to take you, how many people and how much baggage you want to carry, etc.

Even if you can't afford to buy an aircraft on your own, its surprisingly cheap to buy one as a group of, say, four friends.

The following is the approximate operating cost of a typical two place aircraft. This method of calculation can be used as a budget tool to assess any aircraft you or a group might consider purchasing.

What do you want in an aircraft?

- A 2 place, tricycle fixed undercarriage, fixed pitch, high or low wing aircraft;
- Power plant 100hp engine with approximately 1,000 hours to run to overhaul. This should give adequate performance and a cruise speed of 70 to 100kts;
- Ideal avionics would consist of a digital VHF, transponder and GPS;
- Fuel burn approximately 15 lph Mogas;
- Purchase price around $60,000;
- Pilot proposed flying 75 hours per year.

Based on the above, the following can be estimated:

DIRECT OPERATING COSTS:

Fuel 15 lph Mogas @$1.45 p/l. =	$21.75
Oil 0.1 lph @ $14 p/l. =	$ 1.40
TOTAL	**$23.15**

ALLOWANCES

• **Annual** or Periodic Inspection $1,500 every 100hrs	$15.00
• **Engine** replacement / overhaul $15,000 in 1,000hrs	$15.00
• **Propeller** overhaul $1,000 in 1,000hrs	$1.00
• **Upgrade** budget $500 every 100hrs	$5.00
TOTAL	**$36.00**

DIRECT COSTS & ALLOWANCES	**$59.15**
FIXED COSTS	
Insurance: $3,500 per year	$3,500
Hangarage $200 per month for 12 months	$2,400
TOTAL	**$5,900**

Fixed Costs annually $5,900 divided by hours flown.

Private Owner @ 75 hours p.a =	$78.67 p.h.
Group Owners @ 4 x 75 hrs p.a = 300hrs	$19.67 p.h.

1. PRIVATE OWNER COSTS

Direct costs + allowances	$59.15 per hour
Fixed costs	$78.67 per hour
BASIC COST PER HOUR FLOWN	**$137.82**

2. GROUP OWNERSHIP COSTS

Direct cost and allowances	$59.15
Fixed costs	$19.67
BASIC COST PER HOUR FLOWN	**$78.82**

3. COST OF OWNING THIS AIRCRAFT VERSUS INVESTING @5%:

PRIVATE OWNER

$60,000 @ 5% Return on Investment (ROI)	$3,000 p.a.
$3,000 over 75hrs flown p.a. =	$40 p.h.
ACTUAL COST PER HOUR $137.82 + $40 ROI =	**$177.82**

GROUP OWNER

$15,000 @ 5% ROI =	$750 p.a.
$750 over 75 hours flown p.a. =	$10 p.h.
ACTUAL COST PER HOUR $78.82 + $10 ROI =	**$88.82**

THE ADVANTAGE

Group Owner/pilot cost per hour	$88.82 p.h.
Solo Owner/pilot cost per hour	$177.82 p.h.
Group Owner/pilot saves approx	$89.00 p.h.

Compared to the costs of hiring an aircraft from another operator, the saving is still considerable.

The allowances need to be invested and not consumed, so the funds are available when needed. (For example engine, propeller and upgrades $21 per hour – see Allowances.)

Group investment 300 hours @$21 p.h. =	$6,300
Sole Owner investment 75 hours =	$1,575

GROUP OPERATION AND CAPITAL

Each group member has invested $15,000 to buy the aircraft. If a group member had invested $15,000 @ 5% interest the return would be $750, or:

Put another way:	$10 p.h
Add in their hourly cost of	$131.37
The hourly cost would be	$141.37
The sole owner would have invested	$60,000
The return would be	$3,000 or $40p.h
Add in their hourly cost	$190.37
The hourly cost would be:	$230.37

CONCLUSION

Choose a group of pilots who get along well with each other. Structure the group's method of operation to be fair to all and stay with it. Invest your allowances. Buy well, and when you sell your share, you may get your investment back. Subscribe to *Sport Pilot*, look at the Members' Market advertisements. Be surprised at how affordable it is. It is a buyer's market.

Sicily's Midget Tucano

BY STEFAN DE GRAEF

Tucano over Sicily

IN Sicily oranges grow between the dispersed farms row upon row. Dominated by the still active and massive Mount Etna volcano, this Italian Island was for many millennia almost continuously invaded, occupied and colonised by military, ethnical and economic forces and cultures.

Their various and diverse influences are still visible today. But with the orange industry in decay, partly due to strict EU agricultural quota regulations, an increasing number of Sicilian professionals have reacted by turning to niche market industries and products.

For the past five years, the sky over the scenic medieval town of Caltegirone, located in the island's south eastern Catania province, has been crisscrossed by two small experimental airplanes, based on the Brazilian Tucano trainer design - Flying Legend's Tucano Light Sport Aircraft and the Tucano Replica microlight.

Flying Legend is the much pampered brainchild of Franco Rummolino, an experienced and passionate para-jumper. Franco is the co-owner of the Barum Acciaio industrial company which produces fire and explosion resistant aluminium shelters for the petrochemical industry. Franco decided to use his high-tech metal cutting machines and aviation experience to create, design and build his own aluminium lightweight experimental aircraft.

He teamed up with Paolo Marletta, a member of a local flying club, who had already built a 2/3 scaled wooden Hawker Hurricane replica. The two men decided to 'co-melt' Franco's metal know how with Paolo's wooden aircraft experience. The decision was taken to form a company called Flying Legend to build an aluminium Hurricane-replica to be targeted at the still developing and growing market of experimental replica aircraft.

With no formal assistance from Italy's aeronautical industry, the two men used trial and error, smart and efficient thinking, a passion for aviation and a zero-tolerance for jeopardising safety. Gradually a flyable Hurricane 2/3 replica was created, manufactured in Barum's construction facility, ground tested and test flown with success, all in full compliance with Italian experimental aircraft regulations.

With a workable and flyable Hurricane replica design ready to sell, Franco began evaluating the international experimental aviation market. Unfortunately, at that time the global financial crisis hit hard. The collapsing aviation market in Italy and Europe forced Flying Legend to make some hard decisions.

Instead of further fine tuning the Hurricane replica, a decision was made to create a second replica model, created and developed for the markets showing an interest in experimental light aircraft.

Franco's eyes went westwards and he chose Brazil's Embraer Tucano tandem trainer aircraft as an ideal design. The economic and financial rise of Brazil and its population, he figured, would also create market opportunities.

The selection of the Brazilian Tucano was triggered by the immense popularity within Latin America and Brazil of the Força Aerea Brazileira (Brazilian Air Force) Esquadrao de Demonstracao Aerea Fumaca. The air show specialists flew - at that time - seven stunningly coloured Embraer EMB-312 (aka T27) Tucanos. To give potential buyers a similar 'Fumaca' experience while flying their own replica, the air-

craft needed to be well-powered by a relatively small-sized engine and capable of aerobatics... all at an affordable price!

Once the decision was taken to create and market a 75% sized Tucano, Franco started a lengthy and demanding conceptual process to cut down the production into individual modules.

He didn't have Disney's 'Honey, I Shrunk the Kids' electromagnetic shrinking machine to instantly shrink objects within seconds, nor did he have Embraer's original technical drawings, so all dimensions of the full-sized aircraft had to be measured and re-calculated manually.

To comply with various prevailing national (and often not uniform) aviation regulations, the aircraft was developed as an experimental kit.

Most experimental regulations insist kit manufacturers deliver the aircraft only 49%-constructed. The buyer needs to complete the remaining 51%.

So to enable the builder to construct his own aircraft without overwhelming technical and practical skills, the design and weight of the kit needed to be as effective, well-documented and straightforward as possible without jeopardising the initial ambition of the manufacturer - to allow his passionate customers to fly a visually identical replica 100% safely.

Flying Legend took all the experience it had gained developing and manufacturing the Hurricane project and designed and manufactured its own rigs and tools for the various elements and parts of Tucano. The company quickly outgrew the Barum facility and shifted to a nearby workshop.

As with the Hurricane, the scaled dimensions of the Tucano replica and LSA-variant all had to be recalculated and remeasured, including the vital centre of gravity and strength of the wing assembly and surfaces.

Similar aerodynamic and centre of gravity tests were needed to test and monitor the impact of the installation of various engine types and the Galaxy ballistic parachute, installed on the back of the aircraft, behind a spacious luggage compartment, easily accessible from the backseat.

Additionally two non-explosive fuel tanks were installed in the wings to further optimise overall safety and survivability for the crew. To give the wing assembly and fuselage a higher G-force tolerance, additional small structural panels were installed at stress points. Lacking the EMB312's Garrett turbine-engine, external 'decorative' engine exhausts were mounted on the engine cowling, to retain the original external appearance and slick styles lines of the original full-size aircraft.

The Flying Legend team

The maiden flight

Tucano LSA

Factory floor

INTO PRODUCTION

Once all structural and aerodynamic challenges had been mastered, the first Tucano Replica prototype, powered by a 100hp 912 Rotax, made its maiden flight with the company's test pilot, Francesco Moraci, a retired Italian Air Force colonel with more than 8,000 hours on Breguet Atlantic MPA's. The first flight out of a small grass airstrip, south of Caltegirone, confirmed the various flying characteristics and pre-calculated performance.

Satisfied, and relieved, by the results of the maiden flight, Franco and the team started to technically and aerodynamically fine tune the design. At the same time, a second, more basic Tucano Replica LSA (Light Sport Aircraft) variant, was developed to target the profitable market of lightweight 'ready to fly' aircraft in Europe and the US. Lacking the retractable landing gear and the variable propeller of the Tucano replicas, the 400kg LSA variant, also powered by a 100hp Rotax, is still able to sustain +4/-2 G-forces, offering its pilot and passenger a Tucano-like flying and cruising experience (aerobatics is not allowed in any RA-Aus registered aircraft).

Flying Legend proudly showed its Hurricane and Tucano replica experimentals at Aero 2011 in Friedrichshafen, Germany, Europe's mecca for general, microlight and experimental aviation affectionados. Both aircraft received a great deal of attention and convinced Franco and his team to start commercialising their aircraft, focussing their efforts on the Tucano replicas.

The company signed a dealership contract in Brazil and in 2014, two Tucano-Replicas were flown to Oshkosh to be shown to an eager American audience. That success has encouraged the team to take the 2015 model LSA and Tucana replica variants to Oshkosh again this year.

To encourage sales in the US and to keep costs under control, Flying Legend is considering manufacturing some parts in the US. Similar arrangements are already in place in France, UK and Taiwan. The international experience has allowed Flying Legend not only to commercialise its products, but forced it to fine tune its kit design and components so they

Scanning for traffic

"Dimensions of the full-sized aircraft had to be re-calculated manually"

Tucano ready-to-fly

match the various national experimental aviation regulations.

In order to comply with France's national regulations for example, owners of experimental aircraft need to construct their aircraft from scratch, only using blueprints and technical manuals.

So far, seven Tucano kits have been sold worldwide, including one to a Taiwanese dealer planning to use the aircraft to market it in mainland China, where the light aircraft market is just starting to open.

With first Tucano orders coming in, Flying Legend is now integrating a supercharged 140hp Rotax into a new version with improved flying characteristics. That will be a rocket.

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

PILOT TALK

The Ops team

Tell someone who cares

THERE are a lot of uncertainties in life, but the time you expect to return from a flight shouldn't be one of them.

The media has been abuzz about one of the most famous vanishing acts - Malaysian Airlines MH370. Finding an airliner at the bottom of the ocean is definitely tough. Finding a missing recreational aircraft can be just as challenging.

Recent accidents have highlighted the need for pilots to take a closer look at flight notification. It is probably the best and cheapest insurance policy pilots can employ. Crash survivability in ultralights is pretty good these days, but we live in a sparsely settled country and surviving the crash may only be the start of your adventure.

Let's consider a hypothetical case. A pilot and his mate decide to take a mid-week jaunt to visit airfields within a two hour radius of their home. There are mountains between the legs and, in a few places, no roads. A quick morning cuppa and "I'll see you this arvo" to their partners and the day beckoned.

The field was quiet, awaiting the usual weekend wave of aviators. The flyers depart for the hills leaving nothing but a silhouette and a smell of fuel to indicate they had gone. They didn't return.

Frantic calls by family members and friends started around 5pm. It wasn't until 9pm a call was made to 'someone in the know'. So it was not until the next day the Rescue Coordination Centre (1800 815 257) could begin its formal Search and Rescue processes. In this scenario the pilots were found. Their engine had fouled a plug, which causing a forced landing in an area no phone coverage and no way out. They had a night under the stars contemplating what effect their disappearance would have on their loved ones. As well, the search effort and media coverage was potentially damaging to the reputation of all pilots, including RA-Aus, which is always working hard to improve our image and privileges.

Sadly, recent similar incidents have resulted in less favourable outcomes. But the drama which unfolds should not have to include the uncertainty of where the pilot intended to fly. There should not be unnecessary and critical delays because no one knows the flight details or the relatives not know who to contact during the critical first phase of uncertainty.

Flying is intended to be an enjoyable activity, but we should never lose sight of the need to be serious about our responsibilities.

At a recent presentation by Australian Maritime Safety Authority attended by the Ops Department, a thought provoking example was provided of the difficulties faced when no one knows the intended flight path. The pilot had a known quantity of fuel, but it was not known which direction of the possible 360° choice he'd taken. It meant AMSA had to search an area of over 400 square kilometres. The aircraft and pilot were eventually discovered unharmed in a paddock just 10nm from the departure airport.

The concept of flight notification doesn't have to be complicated.

WHAT WORKS?

Flight notification with AirServices Australia's National Aeronautical Information Processing System (NAIPS), which must include a SARTIME, is free and only takes about five minutes.

Radio acceptance via Air Traffic Control – although it possibly not relevant to many of our flights.

Telephoning and submitting information with Search and Rescue (SAR).

Alternatively, and less formally, but just as effective and important in case of an emergency, pilots can leave a flight note with a fellow pilot, school or hirer outlining their proposed path, an estimated return time, aircraft registration number and aircraft colour.

Even providing this information to your partner or another responsible person is a good idea - making sure they know the correct numbers to call if you are overdue (1800 815 257) and when to act if you don't positively confirm your safe arrival.

You, the pilot, also need to stick to the plan and set a reminder on your phone to make contact with your responsible person when you arrive.

This needs to become a regular habit.

WHAT DOESN'T WON'T?

Sticky notes on the fridge.
Unconfirmed and unclear SMS texts.
Loose or undefined plans with no firm times.
Hoping for the best.
Family or friends not knowing what to do.

WHAT SHOULD BE INCLUDED AS A MINIMUM IN ANY NOTIFICATION?

- Pilot details and if a passenger is on board;
- Aircraft details including colour and registration;
- The planned route and any likely alternates or stopovers;
- The key times including departure, flight time and expected time of arrival or SARTIME;
- The emergency equipment on board including ELB/PLB type;
- An agreed level of action, based on the flight, to confirm successful completion;
- A responsible person who knows what to do and when.

Of course formal flight notification has additional requirements, including your endurance, but the inclusion of all the key information will provide the basis for an effective search and swift and appropriate action, should the need arise.

Detailed information on how AMSA begins and carries out searches can be found at: https://www.amsa.gov.au/search-and-rescue

WHO ARE YOU GOING TO CALL? (PUT THESE IN YOUR PHONE AND YOUR PARTNER'S PHONE)

Search and Rescue Lodgement/Cancellation
1800 814 931
Rescue Coordination Centre (RCC)
1800 815 257

As the last word, carrying a Personal Locator Beacon is part of every prepared and savvy pilots' plans. AMSA advises pilots not to sweat about inadvertently activating it either. Just call the RCC number and tell them you've done it by mistake. This will also prevent them triggering a search for you.

A PLB can make a tremendous difference to how quickly help arrives. The pilot and passenger in an aircraft which crashed recently in the Nattai National Park were found within hours. In that location, without a PLB, we would still be looking for them.

So next time you plan to go flying, even if it's just in the local area, think about the fundamentals and make them a normal part of your flying, just as you would a pre-flight inspection. Tell someone who cares.

The magic up there

BY MICHAEL LINKE **CEO**

THE newspaper headline "Student flies herself to school from Narromine to Dubbo" touched a nerve with me, as I am sure it did with most members.

A typical member of RA-Aus is a 51 year old man. 95% of our members are men. 70% of our members are 45 or over.

Yet on a cool morning in March, Holly Adams swept the front pages and morning shows with her news. Editors came calling and the likes of David Koch wanted to know how she did it.

Something our 10,000 strong members take for granted is heading out to the hangar and jumping into their aircraft for a morning flight. Yet our national media felt Holly's achievement was so remarkable it warranted front page news.

Why was this?

As a society we are still transfixed by the magic and majesty of flight. And when someone so unexpected jumps into the cockpit, we all sit back in wonder.

This is the unique selling point of RA-Aus – the majesty of flight. People should be flocking to us to learn to fly and take part in an always exhilarating, always enjoyable, social activity.

So as CEO, I ask myself why isn't this the case? Yes, we have had a few clouds on our horizon, but rather than those clouds being in front of us, surely they are behind us now. As a group, a big group, we need to collectively say the future is ahead of us. It's bright and if we all pull together, we can make RA-Aus the best aviation collective in Australia.

Time and again as I visit members, I hear about how wonderful our sport is and how much fun people have. And this was no truer than when I visited Holly at Narromine.

A gorgeous Sunday morning greeted us as Holly's mum, Amanda, picked me up from my hotel downtown. Holly was in the front seat – she can't drive yet.

We arrived at her hangar and, as her mum and I chatted, I watched Holly go through her pre-flight checks. Her pink decaled Jabiru sparkled in the morning sunshine.

The previous evening I had seen Holly as a happy go lucky 16 year old enjoying some Easter fun as teenagers do.

This morning I was transfixed by the demeanour of Holly the pilot, no longer a flighty 16 year old, but a mature pilot with a professional attitude.

I asked her if she was nervous. She said no, she was excited and confident. She loved flying and taking people up with her.

We climbed on board, she gave me a passenger briefing and we began to taxi. Her radio calls were clear and confident. Within minutes we were airborne over the picturesque Narromine countryside. Holly pointed out her house.

I asked her how she came to flying. She spoke lovingly about her father, an inspiration to her, who one day in 2013, while watching an aircraft story on Landline, started the conversation. Within a week Holly had been for her first lesson.

Less than two years later, here I was in awe of this 16 year old chatting to me 3,000ft above the flats of Narromine.

We talked about careers. Holly was keen to learn a little more about my time at RSPCA because, when she was younger, she had wanted to be a vet. But she had struggled to remove a burr from her pet dog and it had put her off.

> *I was in awe of this 16 year old*

I asked Holly if she could fly anywhere, where would she go? Victoria Falls, she replied. But then confided she would go anywhere really, because flying was just so awesome.

We landed a few minutes later.

What an experience it was for me. If we could bottle her enthusiasm, professionalism and her love of flying, RA-Aus would have every 16 year old in the country as a member.

The experience has stayed with me and is something I try to communicate in my day-to-day dealings with members. We all want to fly and from time to time things may go wrong; we may get frustrated by the red tape, confused by the rules, perplexed by the personalities – but at the end of the day it is only about flying and the joy it can bring.

As I jumped in President Mick Monck's aircraft to fly back to Canberra, I told Holly to remember the magic is up there.

She smiled, looked skyward and said "it sure is".

RA-Aus president, Michael Monck, Holly and Michael Linke

The national media felt Holly's achievement was so remarkable it warranted front page news

Life or death tracking systems

BY DAVE TONKS

AFTER yet another tragedy in an ultralight accident, I find the need to put fingers to keyboard to make a statement about the state of affairs with regard to pilots flying any kind of cross country flight.

Firstly, people make mistakes. It scares my wife terribly that she hears of accidents which happen to pilots regarded as safe flyers - pilots with many thousands of hours flight time. Here I am, with a minuscule 200 hours in my logbook and her response to these accidents is "if pilots with such experience and knowledge can lose their lives, why should I think a relatively unexperienced pilot such as you is safe?"

It is difficult for me to counter the argument. All I can say is that I have been taught by the best and I approach my flying with the most professional attitude I can muster. I always do a full 15 minute pre-flight inspection of my Drifter and I always do a walk-around if I fly again on the same day.

Most importantly I look and listen. When I'm flying along, thinking about how nice it is to be up here and a little warning bell goes off in my head – the little voice which asks "who's up here with me?" - I do a little zig-zagging because that helps me (and whoever else is up here with me) have a better chance of seeing a nearby aircraft.

One of the other little things I do is practice engine failure drills – not every flight, but most. The idea is to pull the throttle without thinking "gee, this is a nice spot to do an engine failure drill". Without consideration of my position, I say out loud "engine failure", pull the throttle to idle and start looking for a safe landing field. I usually take it down low enough to make sure I would definitely have a good outcome. And I say out loud the Mayday call without looking at the GPS. On the climb back to cruise height, I give myself a thorough debrief. Above all, I concentrate on the life-saving adage of Aviate, Navigate, and Communicate.

Murphy's Law states that if anything is going to go wrong, it will happen at the worst possible time. When the nasty stuff hits the fan, you need to be focussed on achieving the best outcome. One of the ways you can do this is by planning. How many times do you hear about aircraft not reaching their destination and the authorities had to search hundreds of square kilometres looking for them? You may have survived the impact, but if rescue services do not find you quickly, there is a good chance you will not survive. The longer it takes, the less chance you have.

What can you do to improve your chances? It is a RA-Aus regulation pilots must carry an EPIRB on cross country flights. If you get into any kind of difficulty, you should activate the EPIRB immediately, while you are still airborne (and capable of doing so). If you manage to get your aircraft on the ground safely, you can cancel the alarm by either turning the EPIRB off, and/or contacting the authorities by phone to advise of your situation. If your arrival on terra firma is less than perfect, the EPIRB is already calling for help, even if you can't.

Apart from the EPIRB, there are many different types of stand-alone gadgets you can purchase these days which will regularly send your location to a pre-determined website. Any person suspecting you are overdue can simply log on to the website and, after entering a password, check your current location. Some of the more professional units also record time, altitude and speed, so by looking at that data it can easily be determined if your landing was a normal one and that your location is a landing field (and not a dry creek bed). Google Earth can confirm that.

The technology currently exists for all pilots to carry the means for search teams to locate you extremely accurately. You can choose to fly without this brilliant (potentially life-saving) technology. But if you end up landing in inhospitable circumstances, you may consider (if you are conscious) that it would be very nice to know there will be a rescue helicopter hovering over you in a short period of time.

I am, of course, hopeful that in the not too distant future rescue authorities will take full advantage of the magnificent potential of drones for search and rescue. Imagine a truck pulling up at your departure airfield. The operators set up 10 rotary-wing drones. They are programmed to fly at treetop height along your flightpath and are equipped with infra-red cameras which send a video signal back to the control station. They travel 100 metres apart, with overlapping camera views, giving a total sweep of a kilometre as they search for you. They can fly in all conditions, with no human loss if they fail in flight.

The bottom line is this – all pilots have access to various degrees of constant location technology, limited only by the amount of funding you wish to put into the concept. What I would like to see is for some technologically talented person to do a review of all real-time location systems available.

Let's face it – it can be a matter of life or death for all of us.

DESIGN NOT

DAVE DANIEL

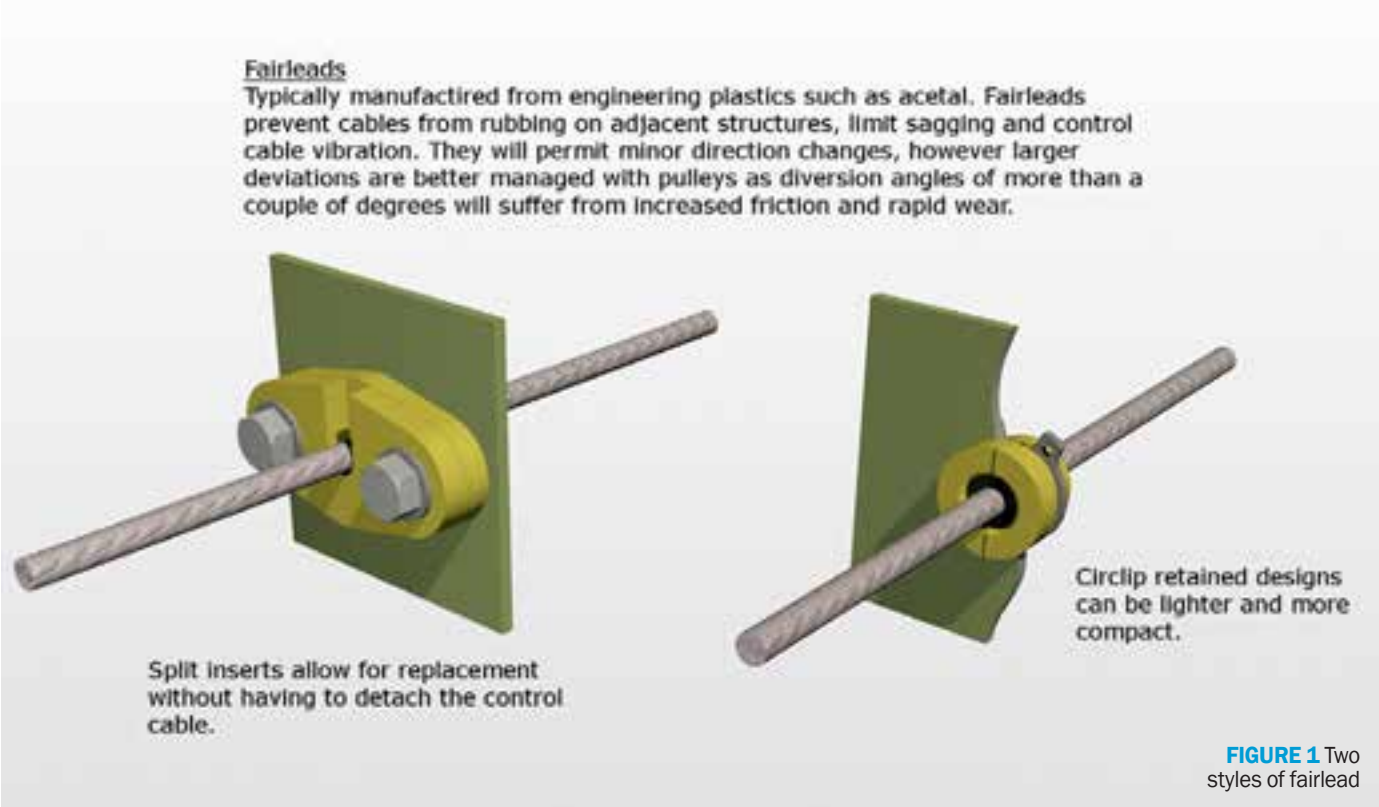


FIGURE 1 Two styles of fairlead

Control freak

WE all like to be masters of our own destiny so, unless you only fly paper aeroplanes, some form of control is pretty much essential. What's more, getting the controls right can make or break an aeroplane design. Certified designs are obliged to meet a whole swathe of regulations relating to control forces and behaviours, but even if you are building an experimental aircraft which doesn't have to comply, you would do well to read the relevant parts of FAR part 23 and think long and hard before ignoring them. Let's be honest, poorly harmonised controls or inappropriate control forces are going to be at best unpleasant and, at worst, downright dangerous.

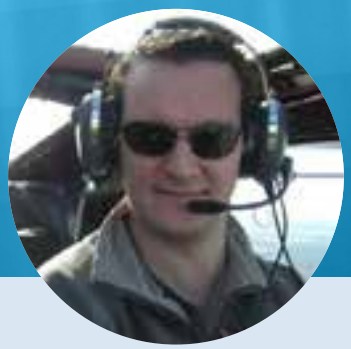
FEEL THE FORCE

I STILL have my Instructor's urgings ringing in my ears to only use my thumb and fingertips on the controls (instead of my usual white knuckle grip) and, the fact that such a light touch is possible, gives a clear indication that low control forces should be readily achievable in an ultralight sized aircraft. It may seem curious, given the light control forces, that whether it's a stick, yoke or wheel, aircraft control mechanisms are almost invariably heavily built. The truth is the strength requirement of most ultralight control systems are driven not by aerodynamic forces, but by the loading an adrenaline fuelled pilot might inadvertently apply during an emergency. After all, if you do find yourself in an inverted spin, being able to accidentally bend the control column or stretch the cables is not going to help!

So how are light control forces achieved? The principal tools are leverage (or some other form of mechanical advantage, such as gearing or hydraulics), and tailoring the aerodynamic forces acting on the control surfaces. Leverage simply allows a trade-off between the distance the controls are moved and the force applied at the control surface. This solution is easily adequate for small and slow aircraft, however if large mechanical advantage is required, big control movements result, a trait which is unpopular with pilots because it tends to give aircraft an unresponsive feel. Wheels or yokes allow more force to be applied by the pilot, but are invariably heavier than a simple stick. Besides, if the control forces for an ultralight are so high they demand two hands yanking on a wheel, then a redesign of the control system is most definitely required.

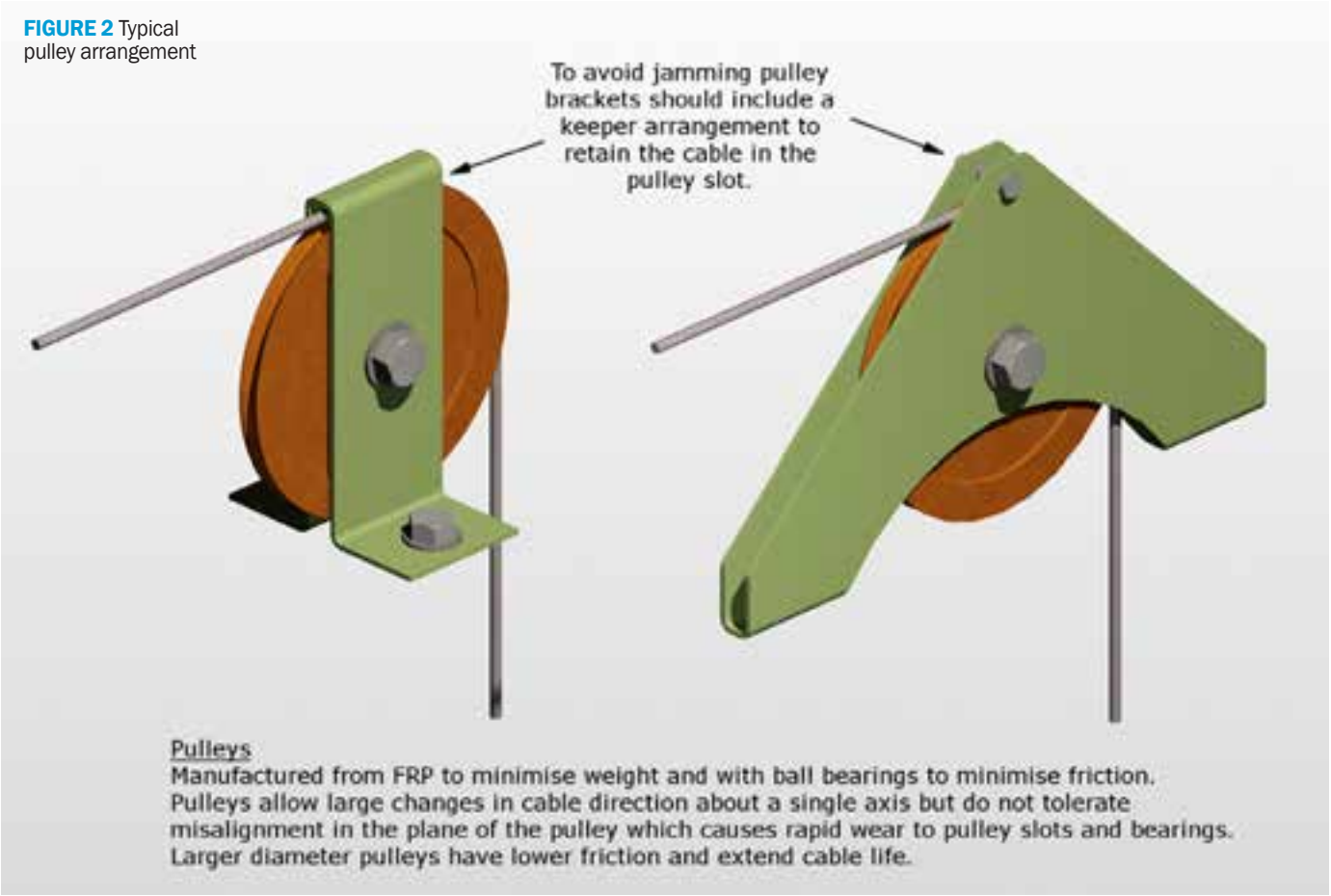
For faster craft, on the other hand, taming the aerodynamic forces is pretty much a requirement - one usually achieved by placing a portion of the control surface's working area in front of the hinge line. This arrangement counterbalances some of the aerodynamic load, reducing the hinge moment required to deflect the surface, and also allowing weight to be added ahead of the hinge line to provide some mass balance for flutter prevention

All-flying control surfaces and servo tabs are also options but they have their aerodynamic quirks, so you really need to know what you are doing before going down this path.



Getting the controls right can make or break an aeroplane design

FIGURE 2 Typical pulley arrangement



PERFECT HARMONY

CONTROL harmonisation is the relationship between the forces required to actuate the aileron, elevator and rudder. The old rule-of-thumb is that they should be in a ratio of 1:2:4, i.e. elevator should require twice the force of the ailerons and rudder twice the force of the elevator. While control harmony might be more immediately noticeable to pilots, control feel is arguably more important, given that it determines the feedback the pilot gets from the aircraft. Well behaved control forces should increase progressively with deflection, increasing airspeed and angle of attack. Controls which get lighter with increased speed or deflection can easily mislead a pilot into making excessive and potentially damaging control inputs. Clearly an aircraft which only requires fingertip pressure to snap off the elevator is going to be dangerous, as is any design which allows control forces to become negative, (actively driving the controls to maximum deflection), potentially causing a control lock which may be impossible to escape from.

ALL A FLUTTER

KEEPING friction to a minimum in the system is necessary not just to minimise control forces, but also to avoid annoying stick-slip behaviour which makes accurate flying all but impossible. Of course, a certain amount of friction is unavoidable and some friction at the control surface end of the system can actually be beneficial, delaying the onset of flutter. Backlash, on the other hand, will always have a negative effect so free-play should be eliminated from the system wherever possible. Trim tab controls deserve special attention in this regard as there have been several accidents attributed to sloppy trim controls triggering flutter and causing the catastrophic loss of a control surface. Cable controls avoid backlash by tensioning the cables to give a pre-load. Getting the tension correct is important: Too much gives an overly stiff control-feel and causes the pulleys and bearings to wear prematurely. Too little tension and the controls feel sloppy and imprecise and, at the extreme, carry an increased flutter risk. Push rod type systems don't suffer from stretch like cables do and tend to feel more positive, but they are sensitive to play in the connections and bearings. This effect is cumulative, so significant backlash can develop when even small amounts of play accumulate across multiple connections. Push-pull (Bowden) cables are most commonly used for engine controls but they do turn up as primary controls in some ultralights. For short control runs designed with large radius curves, they can provide good friction and backlash performance. Doing away with the need for pulleys and bell cranks make this type of system attractively simple and lightweight, but some people are put off by the difficulty in inspecting the system for wear.

TAKING THE STRAIN

DESIGNERS need to be alert to the effects of loading and structural deflections on control effectiveness. Control cables have

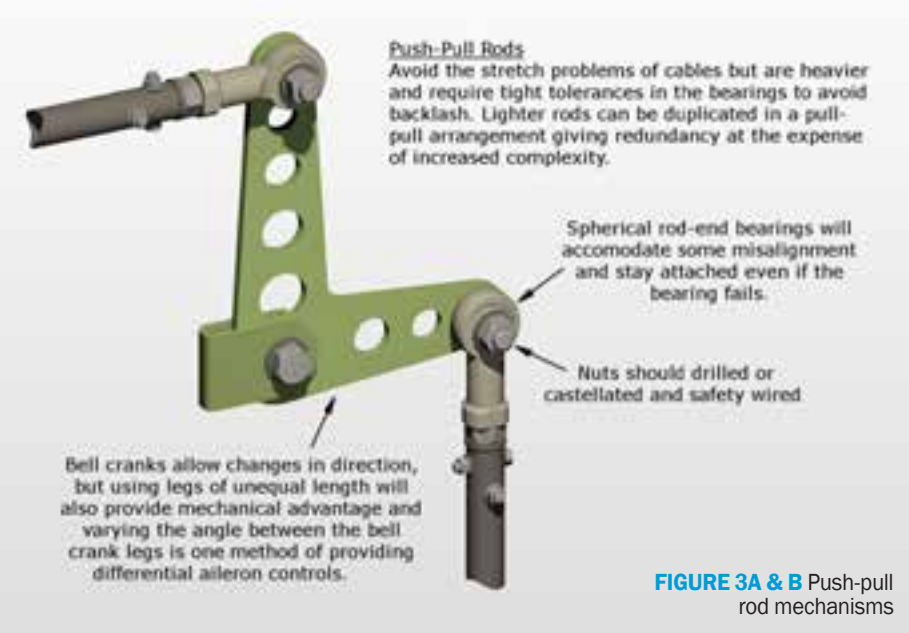
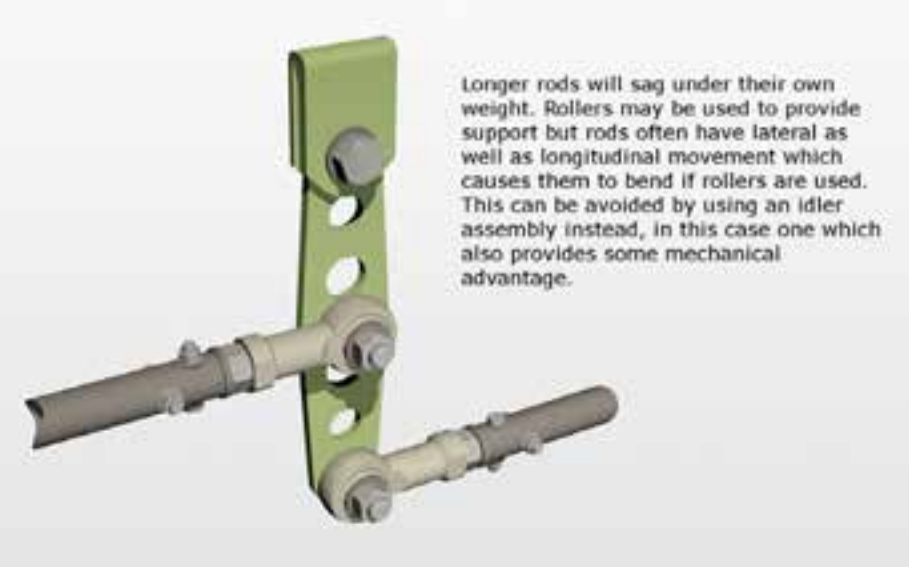


FIGURE 3A & B Push-pull rod mechanisms



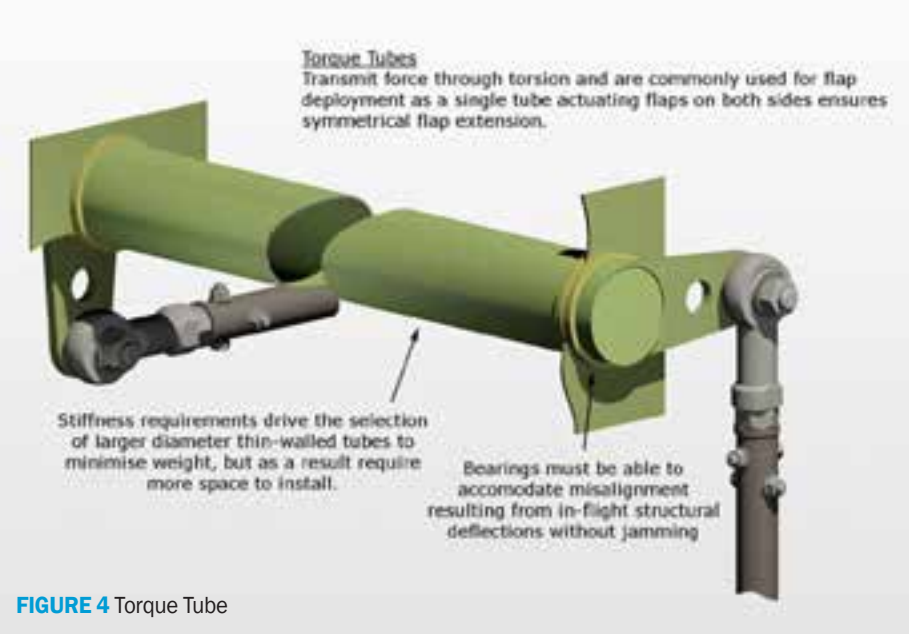


FIGURE 4 Torque Tube

to support their own tension as well as the applied control loads and are susceptible to stretching at higher speeds as forces increase. These resulting forces undoubtedly require sturdy fittings, but there's not much point building a robust pulley bracket and then attaching it to a structure which will flex badly under load. There are stories of poorly designed aircraft losing as much as two thirds of their control deflection at Vne thanks to excessive stretch and flex in the cable system. On a larger scale there's also a risk that poorly designed control mechanisms will rub or even jam during violent manoeuvres, due to the deflection of the supporting structure. To take an extreme example, modern gliders can have wing tip deflections measured in metres at limit loading, but their ailerons must still be able to function smoothly and without jamming. A related issue is the need to route control runs near the centre line of structures which will bend during flight, otherwise structural deflections risk changing the system geometry, lengthening or shortening it, and causing uncommanded control surface movement. Control surfaces themselves can also cause problems. Ailerons or flaps that are only supported at their ends will bend up under load, with the maximum deflection occurring in the centre. In contrast, the wings on which they are mounted will curve the opposite way under load, bending up at the tips. These opposing curvatures can cause the centre of the control surface to bind against the wing, providing good justification for an additional central bearing - which also gives the added benefit of redundancy.

Redundancy, for the uninitiated, is not only a lack of gainful employment but also a vital concept in engineering. Wherever possible flight-critical aircraft systems should be redundant, that is designed to be fault tolerant so a single component failure will not result in the aircraft becoming unflyable. In some respects this is simple to do, like providing three bearings on each control surface as mentioned above, or using rod end bearings which cannot detach even if they fail. Things become more difficult when a single cable snapping can disable a control, but designing a trim system that will provide a secondary means of control in an emergency is a possibility. Where redundancy can't be provided more frequent inspections and maintenance are the only alternative, hopefully catching any failing components before they cause a problem.

It's worth noting that redundancy is not the same as reliability. In fact, a redundant system will usually fail more often due to an increased component count – there's simply more stuff to go wrong. The important aspect of redundancy is that when something does fail, it won't kill you and that certainly sounds worthwhile.

NEXT MONTH Trim

LEARNING TO FLY

Risky Business

BY ANTHONY SIBARY

IT occurred to me recently, that so much of what we do in life is managing risk. A work colleague recently asked me "What happens if the engine stops in the plane you're flying, doesn't that worry you?" No I replied, "The aircraft I fly is fastidiously maintained and I check it carefully before I fly it. And anyway, if there is an engine failure, I have been trained to deal with it".

"Too risky for me, I'll just stay on the ground" he replied.

"What about the risk from staying on the ground?" I asked him. My colleague seemed a little confused by my reply, but that was not the first time I have confused someone and / or been asked such a question. Just ask the lady waiting behind me on the train platform. "Oh I'm sorry, madam", she said as she bumped me. Then I turned around and her face turned pale. In all fairness I did have my hair out.

As recreational aviators, we are constantly explaining to non-flyers how we keep safe in the air and about the study and training we do. Why we fly is not confusing to us. What I like to do is encourage them to visit an airfield and see for themselves. If they still insist it is not for them that's fine, at least they made up their own mind.

To my workmate I replied "Yes, it is incredibly risky for me flying at the Oaks. Especially driving to and from the airfield!"

For me, flying is not risky in and of itself. I manage what risks exist by flying regularly, doing thorough pre-flight checks, undergoing ongoing training and so on. Driving on Sydney roads however, that I know is risky! Yet we never give it a second thought. The car is in the driveway, we get behind the wheel, it starts and we go. Moments later we are travelling at 60km/h, less than two metres from other vehicles moving at the same speed and in the opposite direction.

I am no physicist, but I know if two vehicles collide head on, that is the same as moving at 120km/h and coming to a very sudden stop. Nothing good ever comes from such an impact. Would you say driving is risky? We avoid collisions on the road by managing the risks. There are laws in place to ensure cars can travel so close together at speed. Drivers are trained to drive according to the conditions and to leave a safe distance between vehicles.

Got a cold? Got the flu? Feeling tired? Didn't get enough sleep? You still get in the car and drive don't you? Pilots cannot afford to take such risks as these. Risk management might sound like a buzz term for a new job, but it is what we do every day. For recreational aviators the learning never stops. If we can manage risk successfully we will enjoy our flying safely.

I found studying for the Human Factors exam was tough. There were medical concepts and some of it just didn't seem to have anything to do with flying. But take it from me; it could well be the most important subject you ever study. It is all about how we as humans manage risk. Think of it as occupational health and safety for aviators. There are risks associated with everything we do. If we cannot remove these risks, we must manage them.

I was hoping to share my first passenger carrying experience with you this month, alas the weather in the Sydney Area has either been incredibly wet or windy or both. Not ideal for flying, but the forecast for the next few weeks looks better and I am hopeful I can get in some more left seat time.

Until next time, see you in the pilot's lounge for cocktails and debriefing.

FLIGHT INSTRUCTOR'S FORUM

Facilitated by the aviation guru Professor Avius

Clouding your judgement

The third instalment of the 'Big Three' killers - VFR into IMC. The first two - engine failure after take-off and stalls on base and final - appeared in *Sport Pilot* in April and May 2015.

FACT ONE: Flying into IMC untrained, in an aircraft without the proper instruments, is an incredibly dangerous thing to do. Statistically, accidents involving VFR into IMC are almost always fatal.

FACT TWO: The human element is responsible for all of these accidents. This is true on two levels. With the wrong decisions which put an aircraft into IMC and the limitations of the human sensory system which cause the loss of control.

Instructors should approach the problem from two fronts. Prevention and Cure.

PREVENTION

How does a pilot end up in or on top of cloud? It's often said that nobody ever flew into a cloud when the aeroplane was parked in the hangar. So it's the decision to fly, or to push on in the face of deteriorating weather, that we need to deal with.

Question: How much is too much cloud for you? Instructors like to encourage pilots to know their limitations and always fly within them. So what are your limitations? How much is too much for you?

We tend to judge conditions on the day and make decisions based on forecasts etc. but here are some rules of thumb.

1. When planning a trip ask yourself - is the cloud base going to force you to fly lower than you would like? Remember, in order to remain VFR, you must have a vertical separation from cloud of 1,000ft when above 3,000ft AMSL. So is the cloud going to force you to fly lower? If the answer is yes, plan another route or stay home and watch the TV.

2. Does your destination airfield require an alternate?

- Is the cloud base in the TAF scattered below 1,500ft (or worse)?
- Is the visibility less than 8km?
- Are thunderstorms predicted for the period of your arrival?

If the answer is yes to any of these, technically you should plan for an alternate. But don't stop there. Your plan should always fly over, or near, as many airfields along the route as you can. Do any of those airfields require an alternate? If so, then your spider sense should start tingling. It's all about developing your personal minima.

If the TAF's enroute and at the destination mean you require an alternate, it means there is a reduced safety margin - you need to consider if the flight should proceed at all. It's not illegal to proceed, this is just a method of defining your limitations and giving you some numbers to define your personal minima.

3. When considering cloud, always add together two layers below 5,000ft. E.g. SCT+ SCT = OVC. SCT+ FEW = BKN. Watch those multi layers.

4. Learn to recognise conditions which could produce problematic clouds. Frontal uplift produces low, strataform cloud which can cover huge areas. As a cold front moves through an area, the warmer air is forced to rise as the cold air slides underneath it.

This can produce white out conditions at low altitudes. Study your charts and area forecasts. Fronts are obvious, but they can move faster than predicted. Never race a front to a destination.

5. Low pressure troughs also produce low cloud. These are often localised, but can form quickly and are often difficult to predict.

Good planning, careful study of the forecasts and charts and a 'lets not push it' attitude should keep you well out of trouble.

But what if all that doesn't work?

THE CURE

So conditions have conspired against you - you have pushed on or decided to fly when you shouldn't have. And you find yourself in cloud.

First of all, entry into cloud is very rarely a sudden event. Rather it is usually a slow realisation you are having difficulty making out the horizon or the ground. Or you may start to feel a little queasy with sporadic glimpses of the ground through breaks in the cloud and the ground appears to be at an odd angle.

Let's look at two of the variables.

1. You have been forced up into cloud due to rising terrain or lowering cloud base and just the act of maintaining your height has found you in the soup.

In this situation, keep one thing in mind. Flying on whatever instruments you might have is likely to lead to major problems. So don't do it. Calmly reduce the power, let the nose come down and descend back out of the cloud. Do not attempt to turn until you are clear of it. When clear of the cloud, commence a gentle turn and head back out of the area. Or, if you cannot do that, land immediately in whatever clear area you can.

Remember a precautionary search and landing might bend your undercarriage and stuff up your prop. You may even roll the aeroplane into a ball. But you will almost certainly survive. The alternative will almost certainly end in tears.

2. Stuck on top. This is an incredibly scary situation to be in. Many pilots have found themselves poking across a broken or overcast layer of cloud, as they head towards holes which end up being just dark areas of yet more cloud. One of the problems with this type of

By far, the best way to deal with VFR into IMC is prevention

IMC incident (and yes, this is still IMC because you cannot navigate visually within sight of ground or water) is that up there the sun is shining and it's generally smooth and cool, so you can be lulled into a false sense of security. But make no mistake, the clock is ticking. You do have to come down at some stage.

Recognise this is an IMC event. Turn around. Head back the way you came. Don't be sucked into small holes or dark patches on the horizon.

If that doesn't get you out of trouble its time for the hard choices. Determine your endurance. How much fuel do you have left and how long can you stay up?

1. Confess. Request assistance from ATC or other aircraft which may be able to confirm cloud status at nearby airfields.

2. Ditch your plan. The destination is no longer your concern. Your only priority now is to get anywhere where VMC conditions exist for your descent.

If you carry plenty of fuel and manage the situation calmly, you should be able to find an area where you can descend visually and legally.

THE LAST RESORT

So now we are at the business end. You have no alternative and you are in the cloud. What can you do about it?

1. Your only concern is to fly the aeroplane.

2. Accept the fact. Navigation is now no longer your responsibility. You cannot navigate yourself out of this situation without help.

3. Relax your choke hold on the controls. If the aircraft is trimmed, it will fly perfectly well with little or no inputs from you. It may dip a wing or roll in turbulence, but its natural stability should keep things reasonably in check.

4. Keeping the wings level is all you need to be concerned about.

5. If you have an AH installed, remember tiny movements on the AH equate to big movements of the aeroplane, so limit inputs to keep the little triangle, or aeroplane (on the AH face) on the horizon. You are never going to make an input which moves the little aeroplane off this centre line.

6. Don't look down too much. And never take your eyes off the AH for more than a second or so.

7. Once you are sorted, contact ATC. They are trained to help you. But remember - everything not directly related to controlling the aeroplane is secondary. Only talk when you can.

8. Follow the directions of ATC as best you can. Your only goal is to get visual.

TRAINING

The new Part 61 RPL requirements say a pilot must have two hours of instrument training. The Professor can't recommend highly enough, that RA-Aus pilots get a few hours of this training in an approved aircraft with a qualified instructor.

True IMC is incredibly disorientating. Get the right training and experience it for yourself.

By far, the best way to deal with VFR into IMC is prevention. Study the weather forecasts. Study the charts. If you feel under educated, get further training on reading and deciphering the forecasts.

Set minima for yourself and always be prepared to turn back or land – always remember the clouds have rocks in them!

HOMEBUILDER

DAVE EDMUNDS

Chips with that?

MICROPROCESSORS have evolved with extraordinary rapidity since their invention by engineer, Ted Hoff at Intel Corp in California in 1969. The original Apple 2 released in 1977 for example, was a technology tour de force at the time, sporting a 1Mhz 8-bit processor. Nowadays, computers run at 3.5Ghz, i.e. 3,500 times faster than the Apple 2 with eight times the throughput, as well as a host of other performance enhancements.

Almost since their introduction, semiconductor companies produced chips which had on board a lot of the glue functions previously performed by a forest of other chips surrounding the microprocessor, as well as input output functions designed to monitor and connect with their worlds. Such chips are called microcontrollers and they are perfect for data measurement in aircraft – as well as running your washing machine.

Generic development systems have evolved over the years to make these processors accessible for a range of general-purpose activities. These systems often include integrated programming environments and are targeted at users of all levels. Over the past ten years, one system has evolved to dominate the amateur end of the market - the Arduino. It is open source, so there are a variety of manufacturers, and you can buy one from China for $4.79 including postage. I bought two. It is a good idea to always buy two of anything from China if you can get them for less than $10. The software to go with it is free to download, but I think it is always a good idea to donate to the developers to maintain the system.

> *"It is a basic rule for us amateur programmers that you do not reinvent"*

The ubiquitous nature of the Arduino platform means you can buy an astonishing range of peripheral devices which plug directly into the main board. In Arduino language these are called shields and stack one on top of the other. Over the years various Arduino variants have come out with more capability, but the basic Arduino Uno or clone is the way to go for starters.

The programming language is based on C, for which there is very comprehensive on-line documentation and masses of third-party support. If you decide you want to do something a bit different, making an infrared TV remote comes to mind, there is a well-documented library which can save you the trouble of working it out for yourself. And this is the point. It is a basic rule for us amateur programmers that you do not reinvent. Someone with lots of skill has been there first and is usually more than happy to show you the way. This is particularly the case with open source systems. I find it hard to believe any aviation community does not have access to someone with the skills to program the devices we need.

So how does this impact aviation? Many of us will want to install better engine monitoring in our aircraft. To do so using an Arduino-based system will only cost you the following:

Arduino clone $4.79
Thermocouple shield $44
Display $9.07 - no, scrap that one and read on
Total $57.86

The display is a colour 2.8 inch screen, backlit if you want to, with a quarter of the resolution of a standard TV i.e, 320 x 240 pixels. Of course, it comes with a library of functions to enable you to represent your data graphically. It also comes with an SD slot which allows you to save your flight data. But there is no free lunch. I bought two, of course, from China and neither worked. It is beyond the scope of this article to explain why and my deadline precludes me giving you a description of the replacement US version which sells for $US29.95. I should add this was the only time I have had this sort of issue when buying from China through Ebay.

So, your instrumentation system could cost well under $100, not including the probes. And it gets better. There is heaps of remaining capacity. You can buy an airspeed sensor for $15.88, including the postage, which will connect to the Arduino.

You can also buy GPS, inertial transducers, temperature, O2 and anything else you can think of monitoring for less than the cost of taxiing an aircraft to the ramp. Even a fuel flow sensor will only cost around $100.

It is remotely possible your Arduino board might run out of capability after a few years playing with this system. Never mind. There are versions of Arduinos with vastly more powerful processors and vastly more input output capability. I am nowhere near this stage yet, even though I've played with these systems for perhaps seven years. There is a learning curve and significant work to get such a system to work, but the more you play with it, the easier it gets. Unusually for this sort of system, you do not have to ramp up your skills much to do a great deal more once you get the basic idea.

A genuine Arduino, a clone and a home brew EGT-CHT Arduino shield

In an earlier article, I mentioned using Bluetooth LE to connect to a tablet to display data. This requires serious programming on the tablet side and I have not got there yet.

A couple of articles ago I lamented that in Australia we do not yet have a mechanism for sharing developments of this sort across the aviation community. It should be possible to devise some sort of mechanism using a simple web interface and perhaps a distribution system such as github.

So, if you have got this far you must be a tinkerer, and if you have not already done so, why not buy an Arduino? Buy one from Jaycar if you don't like buying online. Download the software. It is available for Mac, Windows and Linux machines. You will need a USB cable and nothing else to get started. Go to the tutorials and run the 'Hello World' program. This is the standard initiation to a C programming environment. You will get a better idea of the input output of the device if you then run the 'Blink' example which comes with the download. I guarantee if you have got this far in this article without turning the page, you will be excited by exploring the Arduino.

By way of a postscript, I wrote in these pages about a year ago concerning the viability of electric-powered aircraft. My conclusion was that the energy density of batteries precluded anything other than training use, with a sortie time of perhaps an hour. In the past few months there has been news about batteries based on aluminium. These batteries promise around double the energy density, at lower cost with much faster charging. They will be a while yet, but it just goes to show the world is an interesting place.

Members' market

3490 JABIRU 170C

August 2008 factory built. 438 hours TTIS Option 1 panel plus Microair transponder, FC-10 fuel computer, garmin 196 GPS. 10ply front and mains. Always hangared. All AD's complied with. $55000 Contact 0417131816

3526 X-AIR

X-air Standard .Reg 19-3322. Rotax 618. Brolga prop. Doors. Luggage compartment. X-com radio with intercom & two headsets. Spats not fitted but included. 260 hours TT airframe & engine. Maintainance log. Always hangered & covered. Lethbridge, Vic. Peter 0402599306 or Rod 0448470390. REDUCED FOR QUICK SALE $16500

3650 JABIRU J200B

19-4103, Avalon winner 2007. Aircraft in excellent condition, always hangared. TT440 hrs serviced every 25 hrs - Mircoair radio. Garmin 296 and 95 GPS. Low fuel warning light 2strobes, manual flaps NIL accidents Will be sold with top overhaul by Jabiru.. $63,000 ono. Phone: Bevan 0428 536 338 Email: bevanlane@bigpond.com

3806 JABIRU 230D

2007 J230 D, 24-5245, TT 443 hours, Nil accidents, good condition, Dynon D10 EFIS plus analogue instruments,Garmin 296 colour GPS, VHF and UHF radio, transponder, Spats included but not fitted. Price $45,000 Scott 0418 779 586 Bargin of the year great plane

3847 JABIRU SP 500

TT 435hrs, 2200 engine solid lifters, new pistons, rings, through bolts, 85 l tank, Icom 200 radio, GME UHF radio, Lowrance GPS, turn and slip, fuel flow gauge, 2 Lightspeed 20xl ANR headsets, large rudder, upgraded undercarriage, always hangared, 100 kts cruise, GME PLB inc. Reduced $35,000. Narrogin WA. 0400014924

3875 J230

Jabiru J230. t/t 540 hrs top end a/h 40 hrs ago 2006 and flies like new.3blade,fuel flow meter, UHF, vert compass Alot of extras, Orginally $75,000 would like a quick sale now $55,000 phone 0428826551 or arrandale2@bigpond.com

3909 ZENITH CH 300

ZENITH TRI-Z 2+2, LIGHT SPORT AIRCRAFT. CRUISE 110 KTS, RANGE 900 N.M. LYC 0-320, ALL ALUMINIUM AIRCRAFT. T/T 32 HRS. ALL OLIO UNDERCARRIAGE, ALL INSTRUMENTS, GPS, RADIO, TXPDR-MODE C, STALL 48 KTS, WITH FRESH 100 HRLY.. CONTACT BOB, 02 64959251 OR bobo-shkosh@yahoo.com $35,000 O.N.O. THIS IS GA REGISTERED AIRCRAFT.

3973 582 EDGE X TRIKE

This is a golden oldie,still goes well with streak wing ,$6000 also have a trailer to suit purpose built ,$400, Make me an offer they must go . 0401006506

4016 QUICKSILVER GT400 10-1342

503 DCDI 294Hrs Airframe 664Hrs. Dual EGT's, CHT's, & Tach's. Voltmeter.Fully enclosed roomy cockpit. Long range tank. Oversize Lightwing wheels & tyres. IVO prop. Good condition. Flies straight. Docile & easy to land. Great STOL. Airframe & engine proven & reliable. All manuals. Always hangared (YCAB) $8500 feendene@bigpond.net.au 07 32564047

4127 EUROPA CLASSIC

Europa classic only 58 total hrs GA registered but can be Registered RAA full GA panel elec trim, AH, DG,

transponder icon radio with intercom and strobe it comes with its own purpose built trailer two new ANR headsets pilot with Bluetooth 125 knot cruse on 13 litres $60,000 phone Tony 0429132128

4146 FLIGHTSTAR IISC

Brand new Flightstar II-SC. Assembled with flawless attention to detail. Fully enclosed cabin, dual controls, custom carpet interior, Falcon instruments, in-flight trim, brakes & mylar coverings. Plane is not fitted with an engine. MUST SELL. An absolute bargain - will accept best offer over $20,000. Ph: 0431068825

4249 SKYFOX GAZELLE - CA25N

CA25N 1997, VH Reg, AF/Eng TTIS:2487, Rotax 912, Current MR, Offers over $15k, Shona 0487 397 525

4260 FOXBAT A22 LS

Excellent condition, L2 maintained. 100hp Rotax, Warp Drive Prop. Complete with Dynon Skyview panel including transponder. Analogue ASI and Altimeter, tundra tyres and spats, long range tanks, centre joystick, strobes, cabin heat, EQ1 Wireless Headset System and PLB. Hangered in York, WA. $98,500. Andrew Cotterell 0400 246 906 andrew@thecotterells.com

4269 X-AIR STANDARD

X-Air standard 582 blue head ebox rotax 98 hrs frame, 211 hrs motor. Sweetapple prop, Electric start, Icom radio, Garim gpsmap196, EGT, CHT, regular instruments. comes with oil injection kit to be fitted, spats, rings plus assorted bits. Located Casino NSW. ph Bryan 0414722740. great first plane PRICE REDUCED $17,000.00 cash no offers thank you

4274 JABIRU SK2200

Winner best Jabiru Natfly 2013 Great reliable plane now for sale. 110 knot cruise @ 14L/hr. 140 hrs since 1000 hr TBO Brent Thompson 44/60 prop fitted with Jabiru 42/60 spare. Icom A200 radio, Peltor headsets, aircraft cover, Garmin 96 GPS always hangared, no accidents. $30,000 ono. Peter 0429694459

4305 JABIRU 170-C. FACTORY BUILT

24-5500. April 2008. TTIS 565hrs Option A Panel plus Garmin GPSMAP 296 and Monroy Collision Avoidance system. Meticulously maintained by experienced L2 maintainer. All ADs complied with. Always hangered. A fantastic little aircraft and wonderful to fly. Full set of Punkin Head covers included. Ph:Graeme (03)52298041 Mob:0497 425 358

4342 JABIRU 230-C

2007. 240 hrs. Dynan Flight & Engine, as well as standard instruments. AvMap gps. Autopilot. 2 x VHF, UHF, Transponder. 1 Owner. Always hangared. LAME maintained. Excellent condition. $69000 Neg. 0419674073

4345 A22LS FOXBAT

2011 Rotax 912 ULS, 112litre extended fuel 1350hrs Total time. 85kt cruise @ 17lts p/h (4800rpm) Foxbat hand-control Throttle/rudder option fitted allows people with disability to fly without using their feet. Throttle normally locks in the central position. Making way for new model. sheldon@meritaviation.com.au $82,500 inc GST mobile: 0427102540

4354 SAVANNAH VG MODEL

Savannah VG Model - 2008 100hp Rotax 640 hours, Always hangared, Garmin 296 GPS, Tundra tyres (8.00.6) Fuel computer, 150 litre long range tanks, Strobes, X-com radio, Warp drive prop, Odyssey battery Electric trim Well maintained. Located SW of WA. Can deliver. $46000 Ono. Phone Ted 0488644064

4359 MORGAN SIERRA 200

MORGAN SIERRA 200 Airframe 50hrs since factory rebuild. 2011 JABIRU 2200 engine 50hrs since new. Electric adjustable Pilot pedals inflight. Comprehensive VFR panel.110 knots cruise.Purpose-built trailer. NO HANGAR FEES! Aircraft rigs/ de-rigs in minutes. KEEP HOME. GO FLYING ANYWHERE. Urgent Sale for medical reasons. $42,000. 0755242144. gwsb@yahoo.com

4393 LIGHTNING LS1 SPORT A IRCRAFT

100 hourly just completed, inspection completed, registered, Jab 3300, 60 Hrs, through bolts replaced, Dynon D180 Panel, Garmin VHF radio & transponder ,compass, ASI, Trio A/pilot, electric trim & flaps. New tyres & battery. All in V/G condition any inspection welcome. SA All Offers considered no further use. 0408-813501

4402 EURO FOX

Eurofox like new TTIS 54 hrs suit new buyer. Custom built trailer also available. Folding wings for easy transport and storage. Always hangered, price $80,000 phone Peter 0418 381 360 Tyabb

4411 EUROPA XS TAILWHEEL PROJECT - VALUE!

GREAT VALUE. $92,500-firm. Best-equiped Europa project-near finished anywhere. Includes Garmin GTN650 navigator, STEC30-autopilot, Sandel SN3308-EHSI, CGR-30P Engine & Fuel Management system, SL30-nav/com, KR87-ADF, MD93-clock and USB Charger. Electric AH. All equipment TSO's for IFR category. Just panel-worth-more-than-USD$40K. Zero-time-Jabiru-3300 engine-solid lifters. Amazing value aircraft. Call Tony 0413810093

4414 FOXBAT A22LS FOR SALE

Rotax 912 ULS, 112litre fuel tank 85kt cruise @ 17lts per hour (4800rpm) Dynon Flightdeck 180 with Garmin Aero GPS. Total Time in service 1000 with approximately 700 hours on the engine. Mode S transponder. Please contact by email neel@soaraviation.com.au or mobile 0488 747 069

4422 FK-9 EUROPEAN LIGHT AIRCRAFT (ELA)

German designed, ideal trainer. Steerable nose gear, one-piece main gear. Foldable Wings 'Reliable' ROTAX 100hp Glass Cockpit, Dynon EFS-D100, EMS-D120, Auto-Pilot, Radio, Trans, Garmin 695 GPS Electric Trim, Cabin Heat Low Drag >100kt cruise 110lt fuel , 35kg lug.Hangared, L2 Svc $115k Inc GST Gympie 0403 398 173

4423 CESSNA SKYCATCHER 162

Cessna Skycatcher 162, 2012. Airframe 250hrs, Serial No 1600198, Rego 24/8182. One Owner since new. Purchased June 2012. Optional Extras Include second MFD, Sun Visors, Intercom, EGT Sensor, External Power Receptacle and Macaulay Aluminum Propeller. Located Tara, Qld. Price $132000 (GST Inc). Contact Andrew Crowe 0428 657 014

4435 X-AIR STD

Total Airframe 140hrs, Eng 16.5 since factory o'haul, Electric Start, doors, Microair VHF Radio, Intercom, 2 X headsets, standard instruments, $18,300 ONO. Contact: 0412 576 130 or neville_b@internode.on.net

4445 JABIRU SP500 6 CYL

Great little aircraft, excellent condition, factory built, 6 cyl engine,100 wet wings,standard, standard Jabiru instruments, Garmin GPS, always hangered, recently completed 100 hourly by Jabiru Bundaberg, aircraft is located near Kilcoy. Contact John 0402133742.

4447 HANGAR RENTAL RYLSTONE NSW

Hangar rental available at Rylstone Air-park. Concrete floor, insulated with kitchenette. Full details at: http://tucano- replica.blogspot.com.au/2014/07/hangar-rental.html Contact owner 02-9622-1916 AH

4460 JABIRU 230D

2010 factory built J230D. Only 129 hrs. Dynon 180 EFIS. Microair Transponder. Garmin 495 GPS. ATR500 Radio. Cabin Heater. Leather seats. Always hangared. Serviced every 25 hrs by L2 Maintainer. Excellent aircraft in new condition. Cruise 120 kts. Located at Wedderburn Airport Sydney. $77000.00. Phone Michael Sladek 0418 111 787

4461 AIRBORNE XT-912 REG 32-5399

AirBorne XT912 Tundra. 186 Hrs. Always hangared. Serviced every 25 hrs. Microair radio. Streak3 Wing. Skydat GSX display. Tall windscreen.Two headset/helmets & all protective covers for Xcountry adventures. Passenger training bars. Free fully enclosed trailer included for purchaser. Phone Michael Sladek 0418111787

4462 STEAL A LIGHTNING

Jabiru 3300 engine Sensenich Carbon Fibre Ground Adjustable Prop Grand Rapids Sport SX EFIX Including Auto Pilot Grand Rapids EIS System Garmin VHF Radio SL40 Garmin Transponder GTX327 Garmin 695 Colour Moving Map GPS Intercom - PM1000 II Kanad ELT Solid Mount ASI Compass Electric Flap $65,000 Em:aussie258@bigpond.com ph.0413935620

4473 HANGER SHARE - MORUYA

Would you like a quarter share in large (340 sq m), clean and almost new hanger? Power, lighting, room for workshop equipment and sealed access taxiway. Very economic aircraft accommodation at $40k. Phone 0416283111 or jeff.roberts2001@gmail.com

4477 HIRTH 3701 EFI

HIRTH engine model 3701 electronic fuel injection 100hp. Only 10hrs run. In as new condition but requires new computer. Complete with full exhaust system. No gearbox. Several

photos available. Call or email to view photos and further information. $6,000. Phone 0408 124 350 or email texmango@gmail.com

4478 THE ORIGINAL MK1 SHUTTLE

The original MK1 Shuttle. Single seat, 70kt cruise. 503DCDI with 342hrs. Warp drive ground adjustable 2 blade prop with nickel leading edges, 35 hrs. Tundra tyres and differential hydraulic brakes. Flaperons. Garmin GPS. Currently in storage (wings removed). Reason for sale, I want my shed back. $6,000 as is. 0413506538

4479 MGL AVIONICS EFIS GLASS COCKPIT

MGL Odyssey EFIS glass cockpit 10.4" screen. Limited use, as new, Too large for new aircraft. Like to swap for Explorer 8.4" screen, or sell. All cabling shown in photos labeled ready to connect in. Installation and operating manuals included. Selling $2,950. Phone 0408 124 350 for information or negotiate.

4485 JABIRU 230D

2009 Jabiru 230D , rego 24 7237 ,490 hrs , all updates done, 2 owner all long distance less than 400 landings, auto pilot , $78,000 (inc gst) W.A Rob Clayton 0428890066

4487 BRUMBY 610

This aircraft is brand new and has a Dynon 180 glass cockpit plus Garmin 495 GPS and VHF and Transponder. Total time is 13.00 hours Engine time is 500. $120000.00 Contact 0407334456

4488 ZENAIR CH-200

Zenair CH-200.VH or RA-AUS Great looking aircraft loads of performance from the 130HP Continental 0-240. Professionally overhauled 50hrs ago. New paint. Two seat tricycle cruise110kts+. Day/Night VFR new Icom A-210, Nav lights ,beacon and landing light. New concorde battery. IVO prop. 400hr TT AFE Fresh annual upon sale.

4489 WANTED, AIRCRAFT #24 UP TO $100K

Wanted , LSA Aircraft , rego #24 , must be factory built . Prefer Rotax engine . Sorry , no Jabiru engines . Prefer High wing. Willing to spend up to $100,000. If you have a suitable aircraft please do not hesitate to contact me. Terry 0438 131 974

4490 SUPA-PUP AND TRAILER

Supa Pup II airframe = 71 hours, engine = 50 hours on 503 E-type gear box, electric start, dual ignition and dual carb. Purpose built trailer 6.1m (20ft) x 2.31m (7.7ft) x 1.8m (5.11ft) - Inside measurements. Prefer not to separate - $14,000 (ONO) Contact Doug: (03) 52311671 Colac

4493 AIRBORNE OUTBACK 582LC

Airborne Outback 582. New engine only 17 hours. As new Streak 2B wing 46.6 hours. Helmets. Icom radio. Intercom. Training bars. Covers. This Trike is as new, always hangered and is situated in Bunbury Western Australia. $22000. Phone 0408949004 email microlights@iinet.net.au

4494 FLY SYNTHESIS STORCH S500 80HP ROTAX

Great aircraft with 328 hours airframe and engine. Maintained to Schedule 9.5 per Fly Synth maintenance manual. 5 year rubber replacement complete. Dynon D180, Garmin 296 GPS, Micro air radio and MGL backup instrument. Aircraft condition report completed and ready to go. $69,000.00 Call Steve 0428821847 or email sndthompson@bigpond.com

4499 QUICKSILVER GT400

Registered in the 95.10 category, manuals and handbooks are included. Instruments include, ASI, VSI, Altimeter, EGT, CHT, fuel gauge, strobe, mountings for radio, ptt, Keywest regulator, electric pump, voltage gauge, electric start and Tacho. Engine is a Rotax 447 with a ground adjustable propellor. Looks and flies extremely well 0439377463

4500 1/2 SHARE JABIRU J120

1/2 share available in this well maintained aircraft, engine recently overhauled by factory, and all mods up to date,the aircraft is based at YPJT perth, so you will need either a ppl or rpl as well as the Raa pilot certificate as YPJT is class D airspace.$20000

4501 JABIRU J160

2005 Factory Built, TT 2050hrs, Engine 130hrs L2/LAME maintained & rebuilt engine. Removed heads to inspect & replace valve collets, everything perfect. Fully sorted aircraft. My wife and I have flown all over Australia. Nil Accidents, always hangered SW Sydney. Transponder, GPS, 10ply Tyres, Spats. kevin@kevinhome.net 0425 824 742 $43,000

4502 JABIRU J120C

Jabiru J120c 2200B Engine. Purchased new from the factory 8/2008.Always hangared Caboolture Airport. Nil damage 244hrs.Oil and filter changed every 25hrs,serviced as per Jabiru manual. Standard panel with ASI and Garmin 296 also Aero 500 GPS. Hangarage available at Caboolture Airport. Contact phone 0733002879

4503 JABIRU 160D

160D 24-5547 $52000 STD panel , excellent condition Based at Baccus Marsh . Hanger available. If interested ring Bill Mob: 0438 504 104

4505 SAVANNAH S

Well maintained and hangered Savannah S with rotax 912 with 280 total hours UHF and VHF radios and Garmin AREA 500 GPS. In excellent condition $55000 inc GST ono Phone Michael on 0427574129

4514 DRAGONFLY MOTORGLIDER

FlyLight Dragonfly Motorglider. Ultimate soaring freedom. Excellent condition, helmet, radio, headset and trailer included. Can be folded into a car boot in 45 minutes. Easy one man rig. Impeccably maintained and documented. Can be viewed and demonstrated at RAAF Base Richmond. $14,800. 0488208444.

4516 ROTAX 582MOD99 BLUETOP

As new TT25Hrs 65HP, electric start, Bing carbs, gearbox, exhaust, Oil Injection System, Regularly Run, See run in airframe prior to purchase. Also avail near new Warp Drive 3 blade Pusher prop, twin radiators. Details "tp21.net" Motor $7500 Prop $980 Rads $900 Together $9100 Neg Dave 0402 107 927.

4519 AIRSTRIP PROPERTY S.E. QLD.

Airstrip Property S.E. Qld. 384 acres, 900m grass strip. 18m x 15m hanger with power and 18m x 8m annex. 3 bed 2 bath modern home built 2012. Local district offers popular Aero clubs, recreational dams and superb wineries. Asking $ 887,000. Contact owner on 0408 698 235.

4520 CORBY STARLET CJ1

Corby Starlet CJ1 with 2100cc Aeropower eng. including Duel ignition and duel fuel pumps. Separate eng. and airframe maintenance logs. A wonderful aircraft to fly and is in excellent condition. located at Tyabb, Vic. call Ken 0400 974744

4522 JABIRU 160C – REDUCED SALE PRICE

Category: 3 Axis (LSA) Build Year: 2007 Total Hours: 430 Engine Hours: 430, Rego: 24-5179 Price: $50,000 Neg. Immaculate !!! As new, factory build, lame maintained, all AD's done,recent top end o/haul, also honed and new rings. Std panel, dual microair, transponder, fuel flow, aero 500 gps, headsets, covers, service report avail, leakdowns, compressions , perfect. Will deliver anywhere, looks and flys just beautifully. Upgrading to jab 230C, so need this beautiful 160 sold. Contact: Russ 0418276747

4523 X-AIR 3194

Rotax 503 Engine. 435 Hours TT. E/AF. STD. Instruments Radio, 3 Blade Brolga Prop. 55/60 cruise. Reg Oct 2015. Good Order. 503 performs well. Good fun machine. $11500 Phone Horsham VIC 0353824766

4524 SEAREY AMPHIBIAN

2010 build with Rotax 100ULS. TTAF and engine 142hrs. Dynon D100, XCOM VHF, Microair XPNDPR, back up ALT, VSI, ASI, TC, Garmin GPS. Includes Waterborne Endorsement & RAA certificate training in this aircraft if required. Go to www.sportpilotflying-school.com.au/searey for more details and photos or email searey429@mail.com or 0408924089. $79,000.

4525 JABIRU 230D

Jabiru 230D 2009 factory built J230D. TT 950, Brand new Camit engine. Dynon D100 EFIS, D10 EMS, AVMAP GPS, analogue ASI, ALT, ETC, Dual VHF, Microair XPNDR. Price includes cheap RAA Pilot Certificate training if required. Go to www.sportpilotflyingschool.com.au/jabiru230d for details email searey429@mail.com or call 0408924089. Asking $85,000 inc GST.

4528 EUROPA KIT AIRCRAFT

Classic design with tri gear conversion kit. Airframe kit is complete but requires fresh epoxy. Fin, rudder, tailplanes, anti-servo/trimtab, tailplane assembly, mass balance assembly and spars with upgraded bushes are completed. Cockpit module including fuel tank and flying controls is bonded to the fuselage. John Player 0408985203 Springfield NSW $19,000

4529 THATCHER CX4 PROJECT

Centre section spar and wing spars preformed wing rib nose and rear aluminium sheets 6061 t6 1 x.032 2 x .020 $1000 lot ph 0434515628

4530 BEAUTIFULLY BUILT ROTAX 912 100HP POWERED J160.

It is fast, smooth and reliable. Arguably the world's best LSA airframe with the world's best engine. Full panel, GPS rolling map, transponder, Dynon and more. 3 Blade Bolly ground adjustable prop, big tyres and go fast fairing mouldings. Cruise at 110-115 and outstanding climb performance. Tyabb, Vic Call Jack 0410 479 195

Members can now place their advert online

FOLLOW THIS LINK
www.raa.asn.au/market
Your advert will still appear in the magazine, as well as online.

Advertising rates are $55 (inc gst) per issue online only, $55 (inc gst) per issue in *Sport Pilot* Magazine only and $88 (inc gst) per issue for both the online and classified advert in *Sport Pilot* Magazine. The deadline for print bookings is the first of the month prior to the cover date of the issue. Once the ad is booked for any future print and online issues, it will appear online immediately. (50 words maximum – text will be edited when it exceeds maximum limit). You can place 6 photos online, one photo will appear in the magazine.

Neither RA-Aus nor Stampils Publishing accepts responsibility for any errors or omissions. The members' market is subsidised by members and is for non-commercial sales only.

Before purchasing any aircraft/engines/equipment that appear in the members market make sure that the technical details and registration information is correct for that type and model of aircraft/engine/equipment. RA-Aus takes NO responsibility for the technical accuracy of the details and information attached to each advert in the members' market and may not be able to transfer the aircraft purchase. It also reserves the right to edit or delete advertisements, which it deems inappropriate or mis-leading.

RA-Aus and Stampils Publishing reserve the right to withdraw from publication, without refund, any ad deemed unsuitable, including low quality or faulty images.

DISCLAIMER: Neither RA-Aus. nor Stamplis Publishing accepts responsibility for advertising errors and omissions. Advertisers are also responsible for assessing both the integrity of potential buyers, and the risks that attend online transactions. Since phishing scammers have reportedly been contacting advertisers via the RA-Aus website, you are strongly encouraged to familiarise yourself with the ACCC's guidelines for recognising and guarding against online scammers.

Advertisers index

Competition winner

Troy Barry of NSW was the winner of the competition to win 'The Diary of Jack Flyer'. Thanks to all who participated.

WHERE IS CAGIT?

Current location is at Geraldton, WA. Kelmac Aviation/Mid Western Recreational Flying Club

For more information: Geoffrey McDougall Ph: 0400 760 778

For a full list of the rules about capturing the CAGIT visit raa.asn.au/events/cagit-trophy

STATISTICS

$2.75M
Projected RA-Aus revenue 2014-15

$2.72M
Projected RA-Aus expenditure 2014-15

$30K
Projected surplus for 2014-15

Source: RA-Aus

Quadcopter

The DJI Phantom 3 is a remote controlled, four-propeller quadcopter with a removable GoPro camera mount. It is a serious UAV for those who want some professional looking pictures.

The Phantom is ready-to-fly right out of the box. It includes a remote control unit and receiver, with a transmission range of up to 300m. It also features an autopilot system and a failsafe function which triggers the device to land safely when control is lost.

The quadcopter can travel up to 10 m/s horizontally and 6m/s vertically. The battery should be good for up to 15 minutes of flight.

Price: AUD$1,550.00
Web: www.dji.com

Accessories Bag

Can be used as an overnight bag, spares bag or tool bag. Unique bottom compartment with solid base, great for storing dirty items such as shoes, tools or cleaning gear. Plenty of pockets for storage.

Solid, well made with heavy duty Nylon, non-slip base.

Price: AUD$49.50
Web: www.skyshop.com.au

OFF THE SHELF

Personal Emergency Locator Transmitter

Ameri-King AK451-21 EASA approved ELT for fixed wing aircraft. Triple frequencies - 406 / 243 / 121.5 MHz. In an enduring composite emergency carrying soft case. Long lasting battery package - up to 78 hours at -20°C, end of 5-year life, 10 years useful life time Lithium type, LiMn02, 4 D-Size. Default accuracy 80 metres typical. Exceeds RTCM standards.

Price: AUD$1,295.00
Web: www.ozpilot.com.au

Collapsible jerry can

The flexible bladders are made from durable reenforced Polyurethane/ Thermal Plastics. These materials are puncture resistant, lightweight and easy to store. Will handle all fuels. Easy to carry and handle when using. Most popular tank for light aircraft because it is easily stored and carried to and from refuelling stations. Military Spec reinforced TPU with odour proof barrier.

Price: AUD$49.50
Web: www.skyshop.com.au

HAPPY LANDINGS

New tilt rotor taking shape

ELYTRON Aircraft in the US reports it has completed the proof of concept construction of its new tilt rotor design, which it calls a Verticopter.

The Elytron aircraft is designed to combine the VTOL capability of helicopters with the speed and efficiency advantages of fixed wing aircraft. Elytron's says its solution provides greater safety, speed, and simplicity of operation over any existing class of vertical take-off aircraft, which makes it suited for uses such as emergency medical services, search and rescue, air taxi and oil exploration.

The company says the finished aircraft is close to its weight goal of 500kg and should be ready to begin flight testing by the end of the year.

For more information, www.elytron.aero.

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

At 500kg, its not far off RA-Aus membership

BERT FLOOD IMPORTS

AUTHORISED DISTRIBUTOR
ROTAX
AIRCRAFT ENGINES

912 iS Sport

STRONGER. FASTER. HIGHER.

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

914 F/UL | 115hp

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

912 S/ULS | 100hp

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

582 MOD. 99 | 65hp

912 A/F/UL | 80hp

ENGINES YOU CAN RELY ON.

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

Distributed in Australia, New Zealand, South East Asia and Taiwan by:
Bert Flood Imports Pty Ltd 17 - 18 Chris Drive Lilydale Victoria 3140 Australia
Email: gary@bertfloodimports.com.au **Visit us at:** www.bertfloodimports.com.au
Tel: 03 9735 5655 **Fax:** 03 9735 5699

MENDELSSOHN PILOT SUPPLIES

HUGE STOCK OF QUALITY NEW, USED & OVERHAULED AVIONICS

As our inventory changes daily, please call to discuss your requirements

t (03) 9537 3848 e sales@ozpilot.com.au w www.ozpilot.com.au

DYNON AVIONICS

AFFORDABLE GLASS COCKPIT AVIONICS

SKYVIEW Touch

The latest touch screen display

SV-D1000T/B 10" display ... **$5635**
SV-AP-PANEL A/Pilot control **$795**
SV-KNOB-PANEL **$360**
SV-INTERCOM-2S **$425**
SV-VHF COM-C25 ..... **$1850**
SV-COM-X83 VHF 8.33 ..... **$2995**
Video Input adaptor **$275**

SKYVIEW

SV-D700 7" display **$3680**
SV-D1000 10" display **$4950**
SV-ADAHRS-200 ..... **$1695**
SV-EMS-220/A **$850**
SV-XNPDR-262 Mode S .. **$2550**
SV-GPS-250 GPS receiver **$300**
SV-32 Auto Pilot servo **$1075**

D2 Pocket Panel **$1595**
portable true attitude indicator
EFIS-D60 ..... **$2750**
EFIS-D6 ..... **$2260**
EFIS-D10A **$3100**
EFIS-D100 ..... **$3475**
EMS-D120 ..... **$3065**
FlightDEK-D180 **$4585**

GARMIN

G3X Touch Screen Systems
7" Single system with EIS **$7850**
10" Single system with EIS **$9150**
7" and **10"** Dual system with EIS **$13375**
10" Dual system with EIS **$14095**
GTR 225 Com 25 kHz **$2650**
GTR 225A Com 8.33 kHz..... **$3950**
GNS 430W recertified **$11500**
GMA 240 Audio panel **$1250**
Other Garmin Avionics please call

- WAAS GPS
- Altimeter
- Go To function
- Ground speed
- Track
- Distance

D2 Pilot Watch **$635**

Virb Elite Action Camera
Aviation Bundle with GPS **$750**
Aviation Combo Pack with **D2** **$1195**

VivoFit Activity Monitor **$169**
VivoFit with heart monitor **$219**

ÆRA 795

ÆRA 795 touch screen GPS **$2500**
ÆRA 500 touch screen GPS **$865**
ÆRA 550 touch screen GPS **$1550**
GPSMAP 695 colour 7"GPS **$2250**
GPSMAP 196 ..... **$750**

Portable ADS-B with Attitude
GDL 39 3D unit only **$1050**
GDL 39 3D with DC cable **$1100**
GDL 39 3D w/cable and battery **$1170**

AVIONICS

TRIG

TRIG MODE S TRANSPONDERS ARE AUSTRALIAN ADS-B COMPLIANT

TT21

TT21 class 2 mode S **$3195**
TT22 class 1 mode S **$3500**
TT31 class 1 mode S **$3600**

TT31

TY91

NEW VHF TRANSCEIVERS 8.33 kHz
Remote mount very small & compact

TY91 VHF 6 watt transmitter power for 14 volt or 28v aircraft. Fits into 57mm cut out **$2500**

TY92 VHF high power 16 watt transmitter for 28 volt aircraft **$6500**

BENDIX/KING

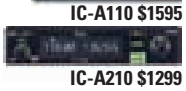
NEW KT74 Mode S transponder **$3995**
NEW KSN 700 Navigator ... **$19950**
KX165A-02 Nav/Com 8.33 kHz **$8150**
KN 64 DME (OHC) **$2595**
KT 76A transponder (OHC) **$995**
KRA 10A Rad Alt (OHC) **$9995**
KR 87 ADF (OHC) system **$2995**
For New BK Avionics please call

BECKER

AR6201 VHF Com 8.33kHz **$2750**
BXP6401 Mode S transponder **$3395**
BXP6401 Class 1 Mode S **$3995**
BE6400 altitude encoder **$425**

ICOM

IC-A110 $1595



IC-A15 $375 **IC-A210 $1299**

F.U.N.K.E.

ATR 833 LCD

ATR 833 OLED

ATR833 LCD 8.33kHz VHF **$2095**
ATR833 OLED 8.33kHz VHF **$2295**

TRT 800H LCD

TRT 800H OLED

TRT800H LCD Mode S xpndr **$3350**
TRT800H OLED Mode S xpndr **$3695**

HEADSETS

The revolution continues with **ZULU PFX** Improved comfort and noise attenuation blue tooth connectivity and auto shut off

ZULU PFX ANR Headset **$1599**
Zulu.2 ANR GA version **$1299**
Zulu.2 ANR Helicopter **$1299**
Zulu.2 ANR Lemo panel ver. **$1299**
Sierra ANR GA version ... **$949**
with blue tooth and music input

HM40 GA H/set **$195**
HM40 ANR H/set ... **$525**
HM51 child headset **$225**
Peltor 8006 GA H/set **$399**
Sennheiser HME 110 **$479**
Sennheiser S1 Passive **$579**
Sennheiser S1 Digital **$1499**
Sennheiser S1 Heli **$599**
David Clark H10-13.4 **$525**
David Clark H10-60 **$599**
David Clark H10-13H **$549**
David Clark ProX ENC **$1025**

Bose A20 Headset
A20 GA twin plug w/bluetooth **$1350**
A20 GA twin no bluetooth ... **$1250**
A20 Helicopter w/bluetooth **$1350**
A20 Lemo w/bluetooth **$1350**
Installed wiring harness .. **$75**

iPad GPS

Bad-Elf Pro+ GPS **$395**
Bad Elf Pro GPS **$280**
Bad Elf 1000 GPS **$180**
Bad Elf 1008 GPS **$200**
Garmin GLO Aviation .. **$195**
Garmin GLO GPS **$175**
GNS 2000 GPS **$150**
DUAL XGPS150A GPS ... **$160**
DUAL XGPS160 GPS **$220**

Kneeboards
i-Pilot for iphone ..... **$ 60**
i-Pilot for mini ipad ..... **$ 70**
i-Pilot for ipad ..... **$ 80**

MICRO AVIONICS

MM001B Integral helmet **$795**
MM001C Integral helmet with VOX electronics **$995**
MM020A Helmet only **$349**
MM001 UL100 headset **$440**
MM001A UL200 ANR headset **$575**
MM005 Powered Radio Interface **$495**
MM030 Single Head Strobe **$165**
MM032 High Power Double Strobe **$395**
MM033 High Power Triple Strobe **$495**

TRAFFIC ALERT

MONROY TRAFFIC WATCH
ATD-300 Traffic Watch ... **$1250**
ATN-300 + ANT 300 antenna **$1695**
ANT-300 + ANT 300 + ARINC **$2250**

AVMAP

Ultra EFIS GPS **$1695**
EKP-V navigator GPS ... **$2495**
EKP-V EFIS system **$3850**

INTERCOMS

HM 2 place portable **$199**
HM 2 place for Icom **$199**
HM 4 place portable **$299**
PS Engineering **PM500EX** **$425**
Sigtronics SPA 400 ..... **$295**

INSTRUMENTS

RC ALLEN

(TSO approved)

RCA 2600 digital horizon (electric) **$4295**
RCA22-7 horizon (vacuum) **$1395**
RCA82A Turn Coordinator (electric) **$1395**
RCA15 series D.G. (electric) from **$3650**
RCA11A-8 D.G. (vacuum) **$1395**

MID-CONTINENT (TSO approved)

MD-90-1 Quartz Clock ..... **$ 449**
TA102 Dual USB charging port .. **$ 499**
7000C.31 Vertical Speed Ind. **$1190**
1394T100-7Z Turn Coordinator **$1299**
5934PM-3A.84 Altimeter 20k **$2250**
MD200-306 CDI **$3249**

JP INSTRUMENTS

FS450 FUEL FLOW
With Transducer, fittings, Firesleeve and GPS interface **$850**

PRECISION vertical card compass **$545**

NON APPROVED INSTRUMENTS

GH030 (vacuum) Artifical Horizon **$695**
GH025 (electric) Artifical Horizon 14v .. **$1495**
GD031 (vacuum) DG **$695**
GD023 (electric) DG 14v **$1495**
BZW-4B turn coordinator **$525**
BG-3A Altimeter 20,000 ft **$495**
Vertical Speed Indicator **$225**
Magnetic compasses **$150**
Vertical card compass **$299**
Air Speed Indicators from **$225**

AVIONICS INSTALLATION

We specialise in experimental and most LSA aircraft.

Custom made harness and loom service.

Garmin G3X EFIS system and custom harness.

Dynon Skyview EFIS and custom harness.

Quality work fully guaranteed.

SURVIVAL EQUIPMENT

SURVIVAL PRODUCTS

4-6 PERSON TSO'd RAFTS

TSO'd raft with canopy .. **$3595**
TSO'd raft with FAR91 survival equipment **$3895**
Specially designed for light aircraft
"The lightest most compact rafts in the world"

LIFE JACKETS

HM SURVIVOR
Slim line NON TSO life jacket with light and whistle .. **$150**
5 Year Service Life
(HM Survivor pictured)

RFD 102 MK3
Approved life jacket in sealed bag 10 year service life **$199**

PLB and ELT

GME MT410G PLB w/ GPS **$375**
Ameri-King AK-451 ELT (406 Mhz) **$1295**

FAMILY RUN BUSINESS FOR OVER 25 YEARS

ALL OUR PRICES INCLUDE GST

Our policy is to sell only high quality products which offer value for money. If you are not completely satisfied, please return the goods in original condition within 14 days of purchase for replacement, exchange, or a full no quibble refund.

FOR THE BEST PRODUCTS AND SERVICE, CALL CASSIE, ROY OR HARRY ON PHONE NUMBER 03 9537 3848. All prices subject to change.

RUN BY PILOTS FOR PILOTS

PO Box 1038, Windsor, Vic. 3181