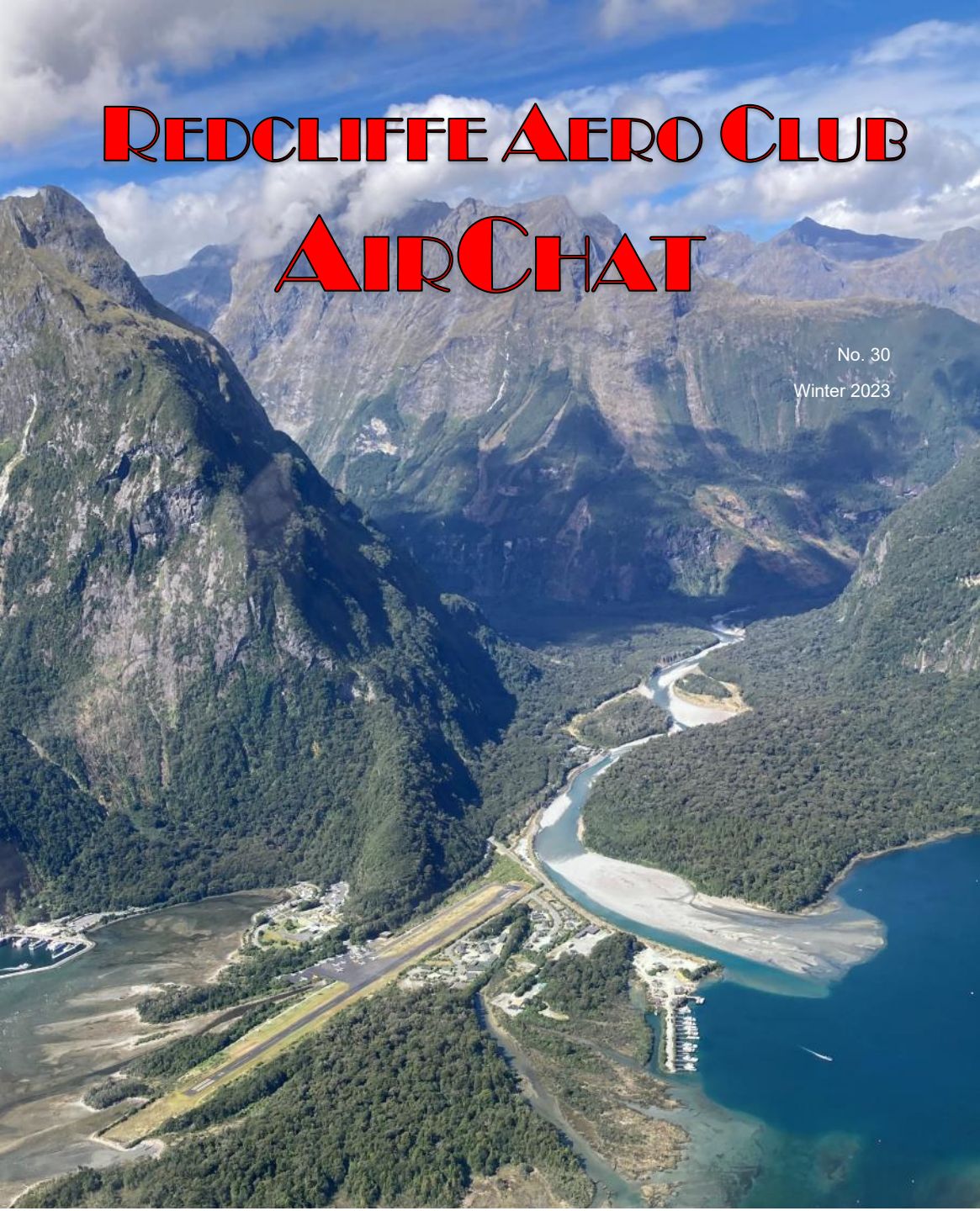
Redcliffe Aero Club

AirChat

No. 30

Winter 2023



OVER 50 YEARS OF PROFESSIONAL AVIATION TRAINING
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And anything in the magazine that is highlighted in blue is a hyperlink that will take you to the relevant web page.

Front Cover: Milford Sound, New Zealand
Rear Cover: Double Island Point

From the President

Hello everyone and welcome to the winter edition of AirChat for 2023.

The Club has been steady with instructional flights over the past months since Christmas. Some of the final La Niña weather events impacted us with aircraft being kept on the ground but we managed to catch up with some students in the Sim. Hopefully as we move into winter the weather will be kinder to us.

We say welcome to Andrew Kykkanen, one of our new Instructors. Andrew is familiar with RAC as he did his initial training at our Club back in 2012. Please make Andrew welcome when you're next at the Club.

We also welcome Melissa Hearn to the RAC board as a new director. Melissa replaces Ristan Greer who retired from the board recently.

The Club's first Friday night of the month barbecues are very popular. We have had visits from Luke Howarth, Federal member for Petrie and Councillor Sandra Ruck from Moreton Bay Regional Council. They both had a very positive response and showed great interest in the running of the Club.

Club flyaways are all planned now for the year and a list can be found on page 7 of this edition of AirChat.

Our annual Anzac Day dawn service and flight up to Noosa didn't happen as planned due to the weather. The dawn service went ahead as usual but this time was followed by an early BBQ breakfast then a seven ship in company flight to Moffatt Head and return. We had 35 attend the service which is a great tribute to the spirit of Anzac Day.

Happy Landings

Mike Cahill

President

Redcliffe Aero Club 2023

Lining up for take-off on Anzac Day

CEO update

Dear members

The start to this calendar year has been kinder to the Club in terms of weather compared to the flooding events of February 2022. Subsequently aircraft utilisation and student progression has improved markedly.

Early in the New Year we began a new double diploma (Commercial Licence and Instrument Rating) for a number of new students with no previous aviation experience. They are progressing well and are now well into their PPL navigational exercises.

To help us achieve our training outcomes we have welcomed Andrew Kykkanen back to the Club. Andrew did his GFPT (the equivalent of a Recreational Pilot Licence) and his Private Pilot Licence at the Club. He also worked behind the counter doing administration/reception/ operations type tasks for a year back in 2013. Andrew is now a Grade One Instructor with multi-engine and instrument rating training privileges, effectively replacing Andrew Wells' skill set. As reported in the last AirChat Andrew Wells has moved on to the airlines.

The Registered Training Organisation (RTO) side of the business has also seen some changes with Lauree Skene-Gordon moving on to pursue other RTO challenges. We wish Lauree all the best in her new endeavours. Taking up the role of RTO Co-ordinator is Rhonda Richings. Rhonda has a most extraordinary skill set and we are extremely lucky to have her at Redcliffe Aero Club. In addition to holding a Commercial Pilot Licence, Rhonda managed the RTO at Royal Queensland Aero Club and was a subject matter expert on Part 141/142 for CASA for eight years. We welcome Rhonda to the Team!

Another positive step for the Club financially is that we have successfully negotiated a survey contract for a new supplier. This service started in March and is keeping the Vulcanair busy. This in turn has increased utilisation of the C310R since initial multi-engine training has moved from the Vulcanair to the C310R.

The combination of improved weather conditions, increased RTO student numbers and the survey contract has seen a significant improvement in the finances of the Club since March.

As always, I encourage you to make the most of our facilities and services be it training, Club flyaways or hiring our aircraft so you can enjoy the privileges of your pilot licence.

Best regards,

Stephen White

CEO

Chief Pilot's report

Welcome to another edition of AirChat.

We will soon be offering places in our Diploma courses to interested students. If you are interested obtaining a Diploma in Aviation, please complete an Expression of Interest form that you can download from our website:

https://redcliffeaeroclub.com.au/

Email it to the address provided.

Numbers are limited and to avoid disappointment the sooner you register your interest the better.

Commercial pilots interested in obtaining a training endorsement should be aware that employment prospects are very good now and job hunting should prove very satisfying. Club members trying to book dual (training) flights at the moment will attest to the lack of availability of flight instructors at our flying school. We are looking to expand the staff numbers in order to meet demand from the community for our services. Our Club has in the past developed a reputation for the quality of the instructors we have trained, and we do prefer to employ the best instructors that our own school has produced.

That said, after a long hiatus, our flying school has recently commenced courses for the Grade 3 Training Endorsement. For the uninitiated, that is what CASA has chosen to call a basic flight instructor course these days. The course is designed to be a full-time course taking about four months to complete. At the end of the course the successful student will be qualified to teach students to fly under the conditions of a CASR part 141 or part 142 certificate flying school like ours. If you add a Design Feature Training Endorsement and a Basic Instrument Flight Training Approval you will be very employable at any flying school.

Becoming a flight instructor can be a very rewarding career move. It's not really a flying job, more a job about people with flying included. It does permit you to get your flying career off to a great start, allowing you to bed down the fundamental skills that you will base everything on that you do in future. Also, some of the training endorsements you can gain will be highly prized in your future piloting career. You will become familiar working in a multi-crew environment just like airline pilots do and you will have a very rewarding time assisting many prospective pilots achieve their goals while contributing to the future of aviation.

Should becoming a flight instructor sound appealing to you, then be sure to have a chat to one of our instructors and they will be happy to answer any questions that you have.

In the meantime, have a good flight.

Cheers

Mal

Mal McAdam

Head of Operations / Chief Pilot

Editorial

Dear Reader

The best time of year is here. Warm days and cool nights and no humidity. Blue skies ahead. Time to get out and explore our great country.

This edition of AirChat contains a few stories that will hopefully inspire you.

Rhonda Richings has taken over from Lauree Skene-Gordon as our RTO co-ordinator and brings us up to date on how our RTO students are progressing. We also meet our new Grade 1 Instructor Andrew Kykkanen (the Flying Finn) who has "returned to the fold" after starting his flying training at RAC in 2012.

FunFlight is a charity that started at the Peninsula Aero Club in Tyabb near Melbourne 15 years ago. It arranges annual events where disadvantaged children are taken for short joy flights in light aircraft. After a two year hiatus due to Covid they held another event in February where their 15,000th child took to the air! Two of the organisers have contributed an article about the event to this edition of AirChat. They're willing to help aero clubs like ours to do something similar.

On a bike ride over summer I stumbled on Hangar 7, a museum in Eagle Farm where, during World War 2, Japanese Zero aircraft were assembled and took to the skies over Brisbane. The aim was to find out how Australian and allied aircraft could beat them in the air - to find their Achilles' Heel so to speak. You can visit the museum free of charge.

Luc George joined us on a trip out west last year where things didn't go quite as planned. He had to divert for some spare parts and had a slightly different adventure to ours. Interesting nevertheless. He describes what happened and how he responded to the challenges that were thrown at him.

Jim Davis explains why Tiger Moths are so great to fly and to learn how to fly in. As he says, "they're easy to fly but difficult to fly well". They teach you a lot about flying in general and he believes everyone should have 10 hours dual in a Tiger before they fly a modern aeroplane.

Recently I had the amazing experience of flying in the mountains in the south island of New Zealand. It was undoubtedly the best flying of my life. You can read about the three day mountain flying course I went on out of Wanaka.

Rob Knight tells us why we should always fly a stabilised approach and what could happen if we don't, while Bob Tait explains how a domino effect that starts on the ground can lead to a tragedy in the air.

Do you run your engine rich of peak or lean of peak? Does it matter? I did a two day course last year to answer those questions and learned a lot about how to take better care of aircraft engines while saving money on fuel and maintenance. Read my report where I share what I learned.

Plus there's some photos from our annual Anzac Day flight up the coast.

Happy reading.

And don't forget - please email me your stories for inclusion in the next AirChat.

Email: airchateditor@redcliffeaeroclub.com.au

Philip Arthur

Upcoming events

11th June Lone Eagle Breakfast Fly-in, Clifton Airfield

18th June Coffee Hop Flyaway: YKCY - YWSG - YGAS - YCFN - YBOA - YHEC - YRED

15th July Noosa Lunch Flyaway

24th- 30th July EAA Airventure, Oshkosh, USA

18th- 20th August Stanthorpe Overnight Flyaway

18th- 20th August Pacific AirShow, Gold Coast

2nd- 3rd September One Long Table Flyaway, Chinchilla

1st- 3rd September Runway Dinner, Shute Harbour

15th- 19th September Warbirds and Wines Safari (Mudgee, Temora, Evans Head)

22nd October 'Tour de Aero Club' flyaway - YCAB, YBSU, YGYM, YTWB, YBAF

Keep yourself informed as to what's coming up and tell us where you'd like to go by joining the RAC Flyaways Facebook group. Click on the link below:

https://www.facebook.com/groups/678739008989427

Also, happy hour barbecues are held at the clubhouse on the first Friday of every month.

You pay only $20 for the best steaks in SE Queensland.

Please call the Club reception beforehand to register for the barbecue for catering purposes.

Recent achievers

Congratulations to all our students who recently completed a milestone in their training at the Redcliffe Aero Club. In addition to those shown here, Tim Juta gained his Restricted Pilot Licence on 22nd December 2022. The whole Club wishes you all well for your future endeavours in aviation.

Joshua Duncan PPL
22 December 2022

Gabriel Goodman PPL
20 May

Jovisres Visda First Solo
15 March

Jaime Clarkson PPL
18 March

Garry Ayre RPL
18 January

Brendan Grainger RPL
11 December 2022

Angus Nugara CPL
6 March

Jeff Huff MEA Class Rating 11 April

Nicholas Arezio
CPL 10 December
MEA Class Rating 22 March
MEAIR 11 May

Matt Hanley First Solo
15 March

Michael Chan First Solo
24 May

Dan Walker
First Solo 9 January
RPL 20 May

Sarsha Pincini MEA Class Rating
11 April

Melissa Hearn
RPL 21 January

Goings on

A few planeloads of members headed to YBCG for a flyaway lunch in February, making the most of a lovely blue sky day to enjoy the views over the islands and the coast itself.

Lunch was at Siblings at Kirra beach - a great spot and the food was sensational.

The April barbecue was a great evening. Luke Howarth, the federal member for Petrie, dropped by to learn how the Club operates.

Councillor Sandra Ruck from the Moreton Bay Regional Council dropped in for our March Friday barbecue. Paul Smeath explained some of the finer details of the Vulcanair.

A few members hopped over to Dunwich for the monthy Straddie Breakfast in February.

And a couple more flew over to Watts Bridge for a monthly breakfast and to have a look at the .JMB VL3 ultralight sport aircraft. An upgraded version for the new 760kg category will soon be imported into Australia.

Attitudes

by Bob Tait

The dominoes at play

Most accidents are the result of a series of 'dominoes' that fall in a particular order

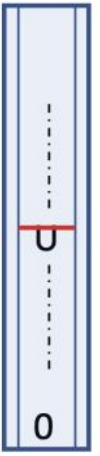
A perfect autumn morning offered near perfect flying conditions for the planned flight from south-east Queensland to a destination in the far north-west of the state. Jenny (not her real name) and her four passengers arrived at the airport early to load and prepare the Beechcraft Bonanza for the long flight. Although Jenny was a capable pilot with a number of long flights in Cessna 210s in her log book, she was less familiar with the Bonanza. This particular Bonanza featured a 'toss over' control column. The control column was centrally mounted with a single control yoke at the end of a rotatable arm. This permitted the control yoke to be situated in front of the occupant of the left hand seat, or rotated to be positioned in front of the occupant of the right hand seat.

The first domino had fallen.

The pilot who had last flown the aircraft on the previous afternoon had been practising short field landings. In this configuration, with only a pilot on board with full flap and landing gear extended, the Bonanza required almost full nose-up trim to maintain the reduced approach speed on final. The pilot did not reset the trim after landing.

The second domino had fallen.

Jenny checked the fuel and satisfied herself that the tanks were completely full, then carried out the remainder of the daily inspection. She organized the stowage of the baggage and directed the passengers to their seats. She was becoming concerned that the departure was running late and was keen to make good her flight-planned departure time. The aircraft was very close to its maximum take-off weight. During her daily inspection she had not noticed that the elevator trim was in the fully nose-up position.



The third domino had fallen.

Like many general aviation aircraft, the Bonanza's trim is achieved by rotating a wheel situated just beneath the instrument panel. Jenny was not a particularly big person and she had to stretch forward in her seat to operate the trim wheel. The recommended procedure is to actually rotate the trim wheel to the full extent of its travel and then set it to the desired take-off position. Jenny checked the trim position indicator instead and satisfied herself that the trim was in the neutral position. The trim position indicator is a ribbon that moves beneath a transparent window with a lubber line to indicate the current setting. The symbols 'D', '0' and 'U' indicate fully nose down, neutral and fully nose up respectively.

The 'toss over' control column that allowed either pilot to take control, but not both

Jenny saw the letter 'U' which indicates fully nose up. However the lubber line was running across the top of the 'U' and she mistook it to be 'O'.

The fourth domino had fallen.

The Bonanza's engine spluttered into life. As the fully laden aircraft gathered speed on the take-off run, the nose began to rise and, in spite of her desperate efforts to stop it, Jenny could not prevent the aircraft from adopting a high nose attitude and finally becoming airborne. The occupant of the right hand seat, who was also a pilot, couldn't help because there was only one control yoke and it was in front of Jenny.

The fifth domino had fallen.

Finally, with the aircraft leaving ground effect, it stalled and descended into trees where the wings were torn off as it exploded into flames and crashed into a creek.

The sixth domino had fallen.

Although it seems impossible to imagine how, everyone on board escaped, with only Jenny suffering serious burns from which she recovered well.

The remains of the Bonanza as it came to rest in flames in the creek

Instructor intro - Andrew Kykkanen

Andrew Kykkanen - aka “the Flying Finn” - recently joined the Club as a Grade 1 Instructor. We asked him to provide some information about his background and aims for the future.

AirChat: How did you become involved in aviation?

AK: My father was taking me to airshows when I was 4 or 5years of age. I definitely got the flying bug from him! The RAAF F-111s and Mirage IIIs made a very lasting impression on me to say the least.

Where and when did you have your first flying lessons?

Redcliffe Aero Club in a Tecnam P2006 (VH-MSF) in 2012.

What type of licence and endorsements did you gain and over what duration?

I did my GFPT (RPL) at Redcliffe in 2013, CPL (MEA class rating) and Command Instrument Rating in Adelaide in 2014, Instructor Rating in Adelaide in 2015, Gas Turbine Endorsement in 2021 and Pressurisation Endorsement in 2022. I did a Type Rating on a CASA212-400 at Nowra in 2021 and a A320 Type Rating in Florida, USA.

Where have you worked as a pilot before moving to Redcliffe Aero Club?

- 2016 Mangalore - Grade 3 instructor
- 2017 Moorabbin - Grade 2 instructor
- 2018 Bacchus Marsh - Grade 2 instructor & safety officer
- 2019 Ballarat - Grade 1 instructor
- 2021 Nowra - First Officer with Skytraders , a ‘quasi-airline’ offering specialist air services to the Australian Federal Government

What other aviation related roles have you been employed in?

I took over from Joe Jenner as Administration Assistant at Redcliffe Aero Club in 2012.

What attracted you to Redcliffe Aero Club?

It’s a home coming of sorts. Everything started here for me.

What do you love most about flying for a career?

To be able to do something in life that I love as a job, and being able to pass my knowledge and experience onto the next generation is very rewarding. Getting paid to do this is icing on the cake.

What’s one of the challenges you've faced over the years?

A forced landing in a Piper Warrior several years ago. I was conducting a VFR nav exercise with a student who had not flown in several years and wanted to get back into flying. The student had limited time in the PA28. We launched out of Bacchus Marsh with a full stop at Moorabbin before continuing east to Latrobe Valley. On arrival at Latrobe Valley while conducting circuits, the engine rolled back on the base leg. I took control and conducted a forced landing in a field approximately one mile from the runway. I learnt a lot that day, about myself and what I’m capable of under duress. What’s that old saying?…self preservation is a very strong motivator.

What was the best day of flying you've experienced?

First solo ranks up there. Sending my first ever student solo was also great. Achieving my first type rating and flying sorties for the military in Nowra, NSW, were also highlights.

What aspects of aviation are you especially passionate about?

The people I've been fortunate enough to meet, work with and learn from. We have two ears and one mouth and I think we should all try to use them in that ratio.

Which aircraft do you like to fly most and why?

The CASA 212-400 AvioCar. This turboprop-powered STOL medium cargo aircraft is a very capable machine. Basically, it's a big 172 with gas turbines, and is a lot of fun to fly. Originally built in Spain, the company has since been acquired by EADS, the parent company of Airbus.

What would you like to achieve in the future?

Command on a wide body would be my ultimate goal.

What would be your dream job?

Flying the Concorde for British Airways or the F-111 for the RAAF. Unfortunately, both these aircraft have been relegated to the history books. I'd be happy flying the 'big girl' the A380.

Where would you most like to fly one day?

I'd like to see more of Australia, Japan, Iceland, New Zealand.

What other hobbies and activities do you have?

I'm an avid runner of sorts, and I try to get to the gym for a workout when I can. I also collect vinyl music. Yes, digital music is convenient but...the ones and zeros just don't add up.

What advice do you have for people wanting to learn to fly?

Make sure you really want to do this because it's an expensive pursuit. If you're not going to give it the time and dedication it deserves, you'll be throwing away good money after bad.

What advice do you have for Club members who want to improve their flying skills?

'The 5 Ps' - Prior Preparation Prevents Poor Performance. Have your own personal minima. If you're not comfortable don't go. You always have the option to reschedule for another day.

FunFlight relaunched in 2023

by Luke Bramston and Ian Johnson

FunFlight is a national registered charity that seeks to give children, touched by adversity, the opportunity to experience the fun and thrill of flight. Born from a drive to 'do something good in the world', the very first FunFlight event was hosted at the Peninsula Aero Club (PAC) at Tyabb on the Mornington Peninsula in 2007, and since then has developed into an Australia wide operation. According to FunFlight's founder, Michel Verheem:

> *"It started with an idea by my good friend Michael Loccisano to fly a small group of 5 to 10 kids with a disability around Port Philip Bay in Melbourne. Within six weeks it had grown into a miniature air show at Tyabb Airport. In total 130 kids and family members went flying at our first event. That success encouraged us to make it an annual event."*

A year later, assisted by a very generous donation, the registered charity FunFlight was founded. Since that humble beginning, we have flown over 15,000 passengers. After a three year hiatus due to Covid-19, and in its 15th year of operation, FunFlight relaunched at Tyabb on 11th Feb 2023.

The charity's success has only been possible with the support of hundreds of volunteers from aero clubs, pilot groups and commercial aviation organisations across Australia. It is their generosity that gets these events 'off the ground'. FunFlight.org facilitates with a framework providing guidance for running the events along with our safety standards. We also support events through sponsorship deals, connections with national charities and media coverage.

FunFlight is proud to have already touched and inspired so many people. Our volunteers, partners and sponsors all make the world a better place, flight-by-flight. Everybody who has been involved in a FunFlight event has seen the smiles on the children's faces and understood that they can make, and have made, a difference. The FunFlight team thank our volunteers and sponsors and encourage others to go out and make a difference in the world.

We generally spend several weeks prior to each event calling every local organisation that deals with the target children in need, ie: cancer patients, family problems, disabled, etc. Some are national organisations with local branches, while some are purely local. In the end we offer flights to every organisation that registers interest. They then approach their families and find potential passengers for the flights. Based on their responses we build a portfolio of likely attendees that tells us how many flights we need to organise. We then put the call out for "Funflight Captains" and planes. If the numbers were so large that we couldn't accommodate them we'd draw a line at some point and close applications, however we have always been able to manage the numbers so far. We have always had enough aircraft, in fact usually more than we need, as pilots are very willing to donate their time and aircraft.

FunFlight Captains must be current, have a current medical and be allowed to take passengers. They also require a minimum 250 hours in command and 50 hours on the type that they intend to fly on the day. The aircraft's certificate of insurance must also be current. QBE insures FunFlight.org, and the event on the day, and asks each pilot to sign a declaration document that is generated by FunFlight.org. QBE also ask for a declaration of any insurance claims in the previous five years. The pilot has to sign to verify all of the above. The host club is responsible to ensure that they know the information is correct either by sighting the original documents or from the knowledge of the pilot as a regular member of the club.

The offer for the flight is to take the child with their siblings and parents or carer. No child may be in an aircraft with only the pilot as this is against the Working with Children principles. Any child with a difficulty will need supervision and this should be by the responsible carer. This means that only four seater, or larger, aircraft are suitable. Same principle with helicopters.

In our history of holding the event, apart from during Covid, we have never cancelled as we have other attractions going, such as clowns, paper aircraft races, sometimes a petting zoo, the CFA with fire trucks and sirens, face painters etc. We have only had one year when there was no flying due to weather on the day, but the kids loved all of the other activities anyway. It is still a big day out for them.

All of our flight instructors have first aid training, we have a dedicated first aid room and a number of our volunteers are nurses or medically trained. Some of our members are doctors and nurses and we ask for their assistance on the day if needed.

In addition to the annual event at Tyabb, FunFlight days have been organised at a variety of other venues over the years including the Darling Downs Aero Club, Lilydale Flying Club and Bankstown Airport.

A huge effort by many PAC volunteers this year saw us fly 135 kids, parents, siblings and carers during the day, each group being taken up for a 15-20 minute flight over the Mornington Peninsula and Port Philip Bay. The day culminated with a presentation to Lloyd Pinn, a 5-year-old child suffering from SWAN (Syndrome Without A Name), representing the 15,000th child to be flown on a FunFlight. There was a sausage sizzle and coffee/drinks for sale to keep people from getting too hungry or thirsty.

Thanks go to the FunFlight team from PAC: Kristine Bramston who communicated with all of the different charity organisations (SWAN, HeartKids, NDIS, Uniting Vic/Tas, AngliCare) to organise the children and families; Ray Taylor as overall Event Manager and Flight Briefing Officer; Danny Laidlaw and partner Michelle for organising the registration and coordination of the pilots and families; Jane Langelaan and Claudia Jones for maintaining calm in registration for the flights; plus Jenny Bolt and the many members of the social group who put on the BBQ, games and drinks. In addition, Rachael Braim, Steve Bull, Peter Cutting and Peter Bernardi helped make sure the grounds and garden looked amazing on the day. We also say thanks to the Tyabb CFA and Cranbourne Air League for their help and support.

Our sponsors included IOR fuels, The Downunder Pilot Shop, QBE Insurance, and Just Press Print and Seagull Press who donated boarding passes for the kids.

While a great day was had for flying, it's always all about the Kids. We had some great feedback from many of the parents and organisations thanking PAC and all concerned for such a great day.

Special thanks to the "FunFlight Captains" including two from the Latrobe Valley and two from Pt Cook Aero Club: Mal Mathers, Matt Williams, John Chalk, Bahri Aldatmaz, David Werner, Peter Moran, Martin Cartlidge, Julian Turecek, Ian Ferrier, Eric Keys, Rowan Finch, Gerard Lappin, and Mark Weiss. They donated not only their time but also their aircraft for the day, using 1000 litres of fuel graciously donated by IOR. FunFlight would not exist without such generosity.

NDIS made a promotional video for the day.
You can view it at:

https://vimeo.com/799304931

Stef Drury also features the event on his Youtube channel.
You can see his video by clicking on the link below.

https://www.youtube.com/watch?v=gvaHO6CiFHc

Everything we did to set up and run Fun Flight can be transferred as an operations document to other clubs or organisations if requested. FunFlight.org will get behind the event should you wish to run one and help you with what you need to organise it. We will not run it for you, but we can help and generate interest.

More information about FunFlight can be found at:

https://www.funflight.org

Luke Bramston is secretary of the Peninsula Aero Club.

Ian Johnson is editor of their "Tyabb Flyer" weekly email newsletter.

T he origins of FunFlight

Fun Flight 2007

The inaugural Fun Flight that took place on 3 June in was a huge success!

Flying with 43 light aircraft from Moorabbin Airport, 120 Fun Flight participants (children with a serious illness, their siblings and parents) experienced a birds-eye view of Port Phillip Bay before landing at Tyabb Airport. PAC supplied lunch and also organised a display of a number of World War II aeroplanes, parachutists and an aerobatics show by Australia's number one air-show performer, Pip Borman. The police helicopter flew in for a visit and the younger children relaxed with a jumping castle and a petting zoo.

FunFlight worked closely with the Starlight Children's Foundation and CanTeen to identify children and families in need of a fun day out.

Richard Ogilvie, from the Fun Flight organising committee said: "The day was exactly what we hoped it would be. It was marvellous to see the participants excited and happy, being able to forget about their next hospital visit or their next chemo treatment. You should have seen their faces when Pip Borman showed-off his unbelievable stunts! Many kids stood there with their eyes wide open, not wanting to miss one single moment. Pip was mobbed like a pop star after he landed and many kids wanted to get their picture taken with him in front of his aircraft.

Founder of Fun Flight, Michel Verheem said that the Fun Flight concept came about through the Landmark Education Self Expression and Leadership Program and its requirement to create a community event. "It started out as a group of friends with 5 or so aircraft organising a joy flight for perhaps 15 kids. Then the Peninsula Aero Club, Moorabbin Airport, the Royal Victorian Aero Club and Angel Flight got involved and before we knew it, it had mushroomed to what it is today: 43 aircraft and 120 participants."

"The feedback from everyone, the participants, sponsors, pilots and volunteers have been unbelievable, and all have expressed that they are eager to do this again. Through the website we have received so many requests from pilots from across the whole nation that we have decided to take Fun Flight nationally!"
"Without our sponsors this would not have been possible, and, from the kids and their families, I really want to thank Redback Marine, Kazba Printing, Paige Lane PR, Air BP, Moorabbin Airport, Angel Flight, Thiess/Holland, RVAC, RJS Group, PAC, Creaware and The Web Showroom."

Both Channel Seven and Channel Nine covered the day in their evening news, showing exciting kids in their aircraft over the bay, and the activities in Tyabb. The Herald Sun published an article the next day

RTO roundup

by Rhonda Richings

It has been a very busy start to 2023!

The year began with changes to the Redcliffe Aero Club Registered Training Organisation office with Lauree moving to her next career challenge. We wish Lauree well and thank her for her dedication and commitment to our RTO over the last 5 years.

I joined the RAC team in late January to manage the RTO Compliance and to support Stephen, Mal and the team. I have an extensive aviation background and I look forward to working with our Board, Staff, and students to ensure that our students continue to excel not only in their training but also in their careers in industry.

There are several entry pathways into the Diploma programs which make them suitable for students with nil experience up to those who already hold Recreational Pilot Licences or Private Pilot Licences.

2023 began with the first of our new Double Diploma students starting their aviation journey at RAC. Matthew Hanley and Jovisres Visda commenced their courses in January and February respectively. Matt and Jovisres had no previous flight training before joining the course and are now immersed in flight planning for their navigation training exercises as they move beyond our local training area.

Many of the 2022 cohort of students are nearing the end of their Commercial Pilot Licence phase of training. These will be the first students to graduate on the new Double Diploma - AVI5022 Diploma of Aviation (Commercial Pilot Licence - Aeroplane) and Diploma of Aviation (Instrument Rating) course. The group includes Jacob Neumann, Alex Beck, Joshua Duncan, Liam Collecutt and Aaron Broadhurst

Matt Hanley preflights VH-RAQ

Jacob, Matt and Alex study for exams

We farewelled Lauree at our February barbecue

Gabriel (Gabe) Goodman joined the program after completing his Recreational Pilot Licence with our Club. Gabe is now close to completing his Private Pilot Licence. Jaime Clarkson joined in early April. Jaime completed his Private Pilot Licence with the Club just prior to commencing the Double Diploma program.

Our last two new students for 2023 commenced the Diploma of Aviation (Instrument Rating) short course at the end of February. It was a welcome back to RAC for Jeffrey Huff, a previous graduate of the Diploma of Aviation (Commercial Pilot Licence - Aeroplane) 2020 course and a welcome to Redcliffe Aero Club to Sarsha Pincini who had previously completed her Commercial Pilot Licence training in Adelaide. Sarsha and Jeffrey are completing their training in our Cessna 310 aircraft, an ideal platform to gain industry relevant experience in an aircraft widely used in air transport operations across Australia. Both Sarsha and Jeffrey have recently successfully completed their Multi Engine Aircraft class rating and are now immersed in simulator training before undertaking the final challenging cross-country phase of the Instrument Rating course.

Sarsha and Jeffrey are closely following behind Nicholas Arezio who is now in the final phase of his Instrument Rating. Nick will also be the last Redcliffe Aero Club student to graduate on the AVI50219 Diploma of Aviation (Commercial Pilot Licence - Aeroplane) and AVI50519 Diploma of Aviation (Instrument Rating) double diploma program.

Liam Collecutt and Gabriel Goodman

From time to time the Australian Skills Quality Authority (ASQA) release new courses which are updated to include new industry requirements. In the case of AVI50219 this was updated to AVI50222 in response to changes made by the Civil Aviation Safety Authority to licence standards detailed in Part 61 Manual of Standards.

Please contact me if you are interested in getting your aviation career off to a flying start!

Email: rhonda@redcliffeaeroclub.com.au

Jaime Clarkson

Nick Arezio, Sarsha Pincini and Jeffrey Huff

Hangar#7 - Beating the Zero

by Philip Arthur

Have you heard of Hangar No.7 where the Allied Technical Air Intelligence Unit rebuilt Japanese Zero aircraft during World War Two? It's located at Eagle Farm on the site of the old Brisbane Airport. Behind a barbed wire fence, Hangar No.7 evokes a time when Australia was under threat and Brisbane was in danger of becoming the frontline in the war.

On 28th April 1943, General Douglas MacArthur, Commander-in-Chief of the War in the South West Pacific, wrote a letter authorising Lieutenant Clyde Gessel and his crew at the Allied Technical Air Intelligence Unit access to all necessary transportation, communication facilities, guards, rations, labour, vehicle fuels and parts for his top-secret mission to analyse why the Japanese aircraft were superior in the air. To do this, the Hangar No.7 crew reassembled a Japanese Zero aircraft then flew mock dogflights over Moreton Bay and Brisbane's northern suburbs.

Early Aviators

Eagle Farm became one of Queensland's early aviation hotspots on 16th August 1912, when Arthur Burr 'Wizard' Stone, a daredevil American, flew his Metz-Blériot monoplane for Brisbane aviation enthusiasts. The American stuntman's aeroplane was an odd contraption of wood, wire and canvas. It was the dawn of Australia's aviation age. The crowds cheered the flying ace higher into the air above Eagle Farm racecourse, the aeroplane climbing and swooping in an astounding display of aeronautics. With his aerobatics, Wizard Stone introduced Queensland to the romance of flight and the reality of aviation. Avid aviation enthusiasts sang the praises of the daredevil American. But it was his teenage apprentice and mechanic, a young Bert Hinkler, who was to become one of Queensland's greatest aviation heroes.

Arthur Burr 'Wizard' Stone's Metz-Blériot

Wartime aerodrome

In 1939 the Eagle Farm airfield was rapidly upgraded as an aviation training school for the Royal Australian Air Force (RAAF).

On 7th December 1941 the Japanese bombed Pearl Harbour, starting the war in the Pacific and bringing the United States of America into the conflict. The bombing of Pearl Harbour was closely followed by the Japanese invasion of the Philippines. On 19th February 1942 the Japanese bombed Darwin. It was Australia's first ever direct attack by a foreign nation.

On 18th April 1942 Prime Minister Curtin endorsed US General MacArthur as Supreme Commander of the War in the South West Pacific. Eagle Farm was immediately developed as a major aircraft assembly depot and military aerodrome for the American forces. Brisbane was the front line, south of which was to be defended at all costs.

At the time of the Japanese bombing of Pearl Harbour, Allied forces had virtually no knowledge of Japanese military aircraft, except to know they couldn't match Japan's top fighter plane, the Mitsubishi Zero. In early aerial battles, for every Zero lost 12 Allied planes were shot down.

The ATAIU's first task was to acquire enough Japanese Zero aircraft to rebuild and fly one. In early 1943 Gessel's team flew to Buna airfield in New Guinea to recover five wrecked aircraft. The remains were brought back to Hangar 7 and used to build a single flyable 'Zeke 32', a variant of the Zero, officially known as Mitsubishi A6M3 Model 32.

Recovery of a Zero in PNG

A Zero flown by Japanese ace Hiroyoshi Nishizawa over the Solomon Islands, 1943.

A Japanese Zero flying over Brisbane with Moreton Bay and the Redcliffe Peninsula in the background

The Allies at Hangar 7 produced crucial identification sheets for Japanese military aircraft. The rebuilt Zero was painted in full Japanese colours then photographed for use by the Allies in pilot training. An army nurse on leave saw and recognized the Japanese Zero above Brisbane and called the police, saying "There's a Japanese plane flying overhead." The duty sergeant scoffed at the report, saying it was quite impossible, but the nurse was right.

In tests over Brisbane, the Allies at Hangar 7 found the Zero could outmanoeuvre even the Supermarine Spitfire with ease, climb at a very steep angle and could stay in the air for three times as long. The Zero's greater manoeuvrability and long range was due to it being incredibly light. To reduce weight the Japanese had used a new top secret, super-light but rather brittle aluminium alloy and removed the normal armour protecting the pilot, engine and other critical points. Allied pilots changed tactics. A traditional dogfight was fatal. It was better to roar down from above in a high-speed pass, fire a quick burst, then climb quickly back up. Any hit would cause the fragile, unprotected Zero to explode.

A video presentation on the story of the Allied Technical Air Intelligence Unit based at Hangar 7 at Eagle Farm Airfield during WWII can be watched via the following link:

https://tradecoastcentralheritagepark.com.au/hangar-no-7-wartime-secrets/#video

You can visit Hangar No.7 in the TradeCoast Central Heritage Park to experience the sounds of the first reconstructed Zero taking off and learn more about the secrets inside.

The Interpretive Centre has much more information about Hangar No.7 including General MacArthur's letter to Lieutenant Gessel, the story of the Mitsubushi Zero, and the Allies' treasure trove of crashed or captured enemy air force equipment.

TradeCoast Central Heritage Park Interpretive Centre is at the heart of three heritage sites at the location of Brisbane's former Eagle Farm Airport at 87 Schneider Road, Eagle Farm. The Interpretive Centre is open from 10am to 4pm weekdays. Entry is free.

Eagle Farm's Zero on 12 August 1943

Nous reviendrons

We shall return (Part 1)

by Luc George

"Nous Reviendrons" is the motto of the No. 6 Squadron based at Amberley. It was supposedly from WWI in France in 1917 when Aussie pilots were going on a mission, saying 'goodbye' to their French counterparts (I guess..) ?

Intro

Like many of us, as a young boy (maybe I still am) I always wanted to fly but never had ten out of ten with my vision (8/10) so I started to climb and ski mountains instead. I also played rugby for over 40 years.

When pilots were allowed to wear glasses, I thought that I may start learning to fly but had to stop playing bloody footy first. An introduction flight was done with C150 Bravo Mike Bravo at the Gold Coast in April 2015 after something like 509+ senior rugby games.

By June 2022, after passing my PPL and buying a plane, we were off on an outback trip. The trip was going to be amazing thanks to Philip Arthur who had been audacious enough to accept us to share (nearly) the same adventure in our little big plane - VH-WKE 160 Piper Cherokee. Phil would be flying in Cirrus MSF with wife Sigi and friends Anne and Harpur. The plan was to fly over Lake Eyre, while it was full of water, kind of a 'once in a lifetime expedition', maybe. From 9th until 19th June 2022 this was going to be an amazing first experience of the Australian outback mate.

Our planned route was: Redcliffe - Tibooburra - Cameron Corner - Maree - Coober Pedy - William Creek - Birdsville - Innamincka - Eromanga - Charleville - Redcliffe.

I invited Scott Underwood along for the ride. Scott is a fully qualified CPL young 'old bloke' I met at Air Gold Coast in late 2018, when we were completing our CPL theory courses.

For more details on the various stops refer to the excellent article by Harpur Michell - 'Wayout West' - published in AirChat No. 29 Summer 2022/2023. Our focus here will be more on the flying experience, going from A to B to C to D etc.

Watts the problem?

Before heading Out West with our 'Wokie' Lady, Scott and I decided to fly to Watts Bridge on Sunday 5th of June to have the local 'brekkie', on a nice breezy day. It was a great opportunity to check that everything was actually OK with the plane before departing. Just five weeks and only 10 flying hours after the annual maintenance at the end of April, I was confident that WKE was ready to go!

I was… obviously not her, as in YWSG we realised the fuel drain underneath the gascolator was leaking. Far worse, lifting the engine cowling, there was some greasy stuff, probably coming from the oil cooler (advice given by Sam Keenan who was kindly trying to help us as a Cherokee expert flying friend!)

On the way back from YWSG, I dropped Scott at YCAB to pick up the car and flew on to YRED where my plane had been maintained for the previous two years at Aircraft Australia (AA).

Before cancelling our plans of being able to fly above Lake Eyre, we still had three days before departure - Monday, Tuesday, Wednesday - to fix it. While a bit upset that the plane had been recently maintained without finding these problems, I was confident (once again) that my LAME mate was going to make it happen.

A new oil cooler was ordered from Superior Air Parts at Archerfield on Monday and after some delays, on departure day, Thursday the 9th June, I picked up Scotty about 10am at Eagle Junction, and headed to Archerfield to pick up the part.

Back at Redcliffe we ate our sandwiches and had a coffee at the Redcliffe Aeroclub, home for us, while the part was fitted. At 1:20pm I received a text message with a smiley saying that WKE was ready.

WKE heads west

My first great decision had been to leave one day earlier than MSF and plan an overnight stopover at St George on the way to Tibooburra, where we were to catch up with the MSF crew. So, we started the engine just after 2pm on Thursday 9th June for what was going to be (due to some headwinds) a three hour flight to St George.

Friday morning Scott and I rose early and headed to the airport. During the preflight we noticed that the right wheel strut had collapsed - it was metal against metal! Suspension on an old plane is always delicate, I guess, as I'm very new into this flying business, and WKE appeared to be no exception. So we were already on one leg (a bit like me) before the adventure really started.

By chance some pilots from 'Precision Aerial' turned up for a crop dusting day with four air tractors AT 802 & AT 602. It was like heaven when we met Damian, the local LAME, who gave me a piece of rigid plastic tube that I cut to about 3 inches long to act as a temporary fix. I opened it and inserted it around my 'wooden leg' with two metallic clamps.

"That's the bush system mate! It works."

And it did - we had no other choice than to trust him.

"Great stuff, Damian, you've saved our trip!"

Eulo

In the meantime, I sent a picture of the strut to my LAME at AA maintenance in Redcliffe who replied that I "must have had a heavy landing".

Awesome, it was done before 10am and we were able to finally fly our dreams above the unbelievable Outback. And at that point we did in fact meet up with the MSF crew when they landed to refuel in St George.

It's a long way to Tibooburra, it's a long way to go ! In fact it was 4.1 hours of Engine Run, with no touch downs.

What a treat, sharing the sky with your aviation mate in the middle of nowhere. 'Know where'… more precisely, as we were making fixes every 20 minutes along the Balonne Highway up to Bollonne and Cunnamulla, with another road leading us to Eulo. We avoided a landing on the dirt strip there to lunch with the MSF crew, just in case our temporary strut fix didn't hold. Instead we kept going, finding our way over a few stations -'Granite Spring' - 'Boodgherree' - 'Old Mirintu'- to the QLD/NSW border. That was the last thing I was expecting to see from the cockpit but a great landmark indeed. Then on over 'Teurika' and finally Tibooburra. Hoorah!

Day one/two of Ozback flying was to be forever remembered, and there was much more to come. But first the well-deserved beers and story swap with the crew of MSF.

Our next planned overnight stop, was going to be Coober Pedy. That one would feature in Phil's log book only, not mine!

During the preflight on Saturday 11th June we noticed the gascolator hadn't been fixed while the plane was parked at Redcliffe. Far worse, it was a really leaking guy. A few calls later, we concluded no one was going to be able to fix it at our supposed next destination, Coober Pedy, nor later at William Creek. And Birdsville was probably a bit too far across the Strzelecki Desert (Gesundheit!) to make it safe. So a diversion was planned to Consolidation Aviation Services (CAS) at Broken Hill.

We had to fly 160 nm over the great outback and under BKN 1500. With two good pairs of eyes and our paper maps we managed to sneak through quite a few showers during the second part of the trip, into completely unknown territory, passing over 'One Tree' and 'Packsaddle' stations. Luckily there were a couple of very well located airfields on stations, like 'Acacia Downs' or 'Yalcawinna' which would have been perfect alternate options, if really needed. We could've said "Hello" and had a cup of tea with the locals…

After first discussing the risks of flying below such low cloud cover with poor visibility (see ERSA alternate requirements) we made it just fine, landing appropriately on 'one leg' in 'Broken Heel'.

What a relief it was to catch up with Michael Grogan's team at the CAS hangar on arrival. Rapidly the O-Ring from the gascolator was found to be suspect. Thanks to the (sorry Ma'am, it was in fact your last) Queen's Birthday, the long weekend was going to mean a long wait for the parts. At best, we were going to have to stay there at least until Tuesday.

Then, what else was there but to head for the Palace (Priscilla Queen of the Desert) Hotel.

On a freezing Sunday morning, we decided to have a bit of a stroll and walked back out the RFDS at the airport for a very interesting visit. My support of the Flying Doctors by buying a warm jacket from them was going to be the best investment ever for the rest of the trip.

Even on a Sunday morning my new best friend, Mike, was battling hard from his home to try to find replacement parts for the gascolator. While we were sitting next to the plane, we sent him photos. He was confident he could find one and called all his mates in the business so we could get the parts early Tuesday morning.

In the meantime, back at the hotel, we were lucky as a fairly good Kiwi singer was performing on both nights, to keep us entertained, while we were trying to not think too far ahead, not knowing exactly what was going to happen next.

On Monday 13th (public holiday) we took advantage of the local pool complex for a good one hour - 2km - swim.

Palace Hotel, Broken Heel

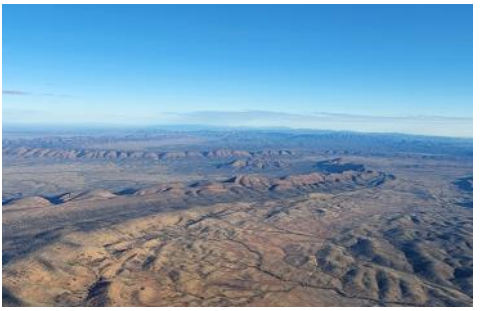
MRT to the rescue

By Tuesday morning the problem had been solved by Mike, who did a fantastic job. The part was ordered somewhere out of Adelaide for delivery on the following Thursday.

So that was when we decided to rent MRT, a cute Piper Cherokee 180, from CAS to keep us going and so we could catch up with the 'dream team' somewhere up north. Scott was the more experienced pilot, so I graciously let him be the one to do the check flight for our next four days of flying. By the time we debated about getting the spare parts delivered on Thursday and us being able to take charge of MRT, it was nearly 2pm when we finally rolled out of YBHI aboard our new bluebird, destination YWMC William Creek, salt lake.

There we were, with no time left to make a low pass over Chris Hemsworth's camp site at Silverton, but we discovered impressive Lake Frome from afar at A065, and jumped straight across the Flinders Ranges. What a stunning spectacle with the perfect afternoon light. No time to inspect the remarkable landscape around Arkaroola however. Passing over Witchelina, with huge Lake Torrens on our left, we kept tracking 300M, the exact direction where the sun was setting, straight towards Curdimurka. At that point we started to spot the contours of Lake Eyre South, the magic was there in full, and finally William Creek. Alas too late to wave at the intriguing Maree Man, as we arrived after four hours of flying time, just before last light at our destination. The last Wrightsair charter for the day landed just behind us.

Staying in such a remote area is full of atmosphere and reminded me of many nights spent in the isolated refuges in the Alps, just feeling the happiness of being there, of just being, more simply !



Flinders Ranges

At breakfast on Wednesday we had a nice chat with the Boss of William Creek, Trevor Wright, then took off for what still may be my greatest experience of flying so far. We had plenty of time to appreciate the absolute thrill of lurking over Lake Eyre, not to disturb the poetry and quietness of the site and keeping a close eye on Artemia Pt on our way to Cooper Creek in order to keep a safe gliding distance.

Then, following the creek southeast to Etadunna, and then northeast up to Kanowana (ruins) and Tirrawara across the Strzelecki Desert, before reaching Innamincka after 2.2 hours of Engine Running. Surprisingly the navigation was great fun and so easy as we could identify most of the little lakes on our way. It was just like a big puzzle at ground level.

Absolutely amazing day indeed! As it was also very exciting to catch up again with our mates who had, while we were in Broken Heel, visited Cameron Corner, Maree, Coober Pedy, William Creek, Birdsville, Betoota and The Dig Tree without us!

William Creek

Lake Frome

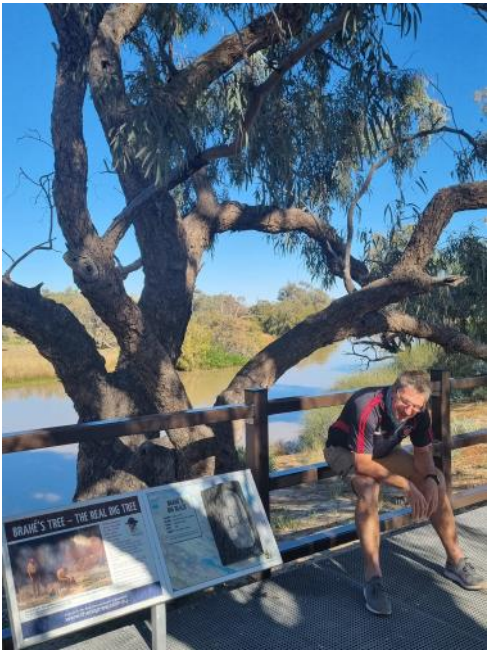
Next day, Thursday 16th June was going to fly us to Eromanga, the town in Australia that's furthest from the ocean. Maybe that's why they found 'Cooper', aka Australotitan Cooperensis, there mate… As we all know, dinosaurs do not like to surf !!

Scott and I decided to leave Innamincka early enough to visit 'The Dig Tree'… what a hell of a place on Earth is that. I absolutely loved everything about it, from the airstrip covered with white sand, surrounded by trees along Cooper Creek, at the cross roads, East-West & North-South of the early exploration of the continent. The beautiful and dramatic landscape was filling my heart with a real feel of adventure. Here we were reading about the Burke and Wills expedition, and even if my 'Scott' was not going to starve with me around it was difficult not to think about the similarities with the other Scott racing Amundsen in completely opposite climatic conditions. But how similar the outcomes… Burke & Wills RIP.

Try to find a fix between Milthaminnie Creek (if you find it) and Noccundra (our next stop) if you can - please come and tell me if you do. Anyway, we found our way and to some very typical Aussie hamburgers, even if we couldn't park our plane with the horses right in front of the pub, like on their website - yeah !

Then we flew to the west of the Wilson River via 'Conbar OS' to Eromanga, where an evening BBQ was going to be a farewell night to our dear friends. The cherry on top of the icing on top of the cake…a magnificent sunset followed by a rising full moon as well! Just dream it if you can.

The Dig Tree



Refuelling at Innamincka

Friday, 17th June, we left our MSF mates and headed south once more. Destination YBHI. After a refuelling pause at Thargomindah, we were back on track towards 'Old Mirintu' (again), the QLD/NSW border, 'Woolshed Tank', 'Salisbury Downs', Wonominta, 'Acacia Downs' (again) and now to the very familiar Broken Hill, in order to swap Pipers. It was the end of a dream run for young Scott as a PIC. "You've flown enough mate, now it's my turn until we reach the Glass House Mountains. Sit back and relax!"

WKE heads east

At YBHI WKE was impatiently waiting for us with a new O 'wedding' ring!! Thanks to Michael who had done an amazing job - even the 'wet hire' deal was a good one… especially when AvGas was peaking above $3 /litre.

With the paperwork all done by midday, we flew towards White Cliffs, where we landed to stretch our legs and watch from above mouse men digging out white patches of sand & opals.

Our stomachs and a hint of curiosity made us touch down at Louth, and its historic pub within walking distance from the airfield, thanks to Phil's encyclopedic outback knowledge. The venue was quite busy and musical, as a function seemed to have attracted all the good living souls from the surrounding stations.

On our last leg (not a bad joke) for the day, with the gascolator and strut fixed, we had nothing new to worry about so could enjoy the scenery of the great Darling River on our way to Bourke. Abundant rains had filled the mighty river bed in a spectacular manner, and from up high, the eucalyptus looked a bit like our mangroves, feet rooted into water !

Sunday 19th June we left our local motel, for a morning walk to find some breakfast. Don't ever try to find a café on a Sunday morning in Bourke. Some nice places were very tempting… but closed. An interesting chat with a fellow traveller who was an "Old Aussie rowing champion" led us to the local supermarket, to feed ourselves.

So finally here we were on our last flight back to 'civilisation' - apologies to the elders past, present and emerging who we pay huge respect to - we knew this adventure was about to end but not in our memories for sure.

Our last game along the route via Lightning Ridge, and Goondiwindi for refuelling was about picking poetic names from the map: 'Warraweena' - 'Bokhara Plains' - 'Eurangie' - 'Gundabloui' - Mungindi (the EAST Post) - "Avymore" - and to identify them on the ground. Awesome ! Why would you have a glass cockpit when you can identify such treasures at your feet mate!!

Heading towards 'Mt. Domville', Whyreema and Esk brought us back into well known territory, where WKE rediscovered her 'autopilot'!

We touched down home in YRED about 4:15pm.

2,585 nm in 29.2 hours.

Stay alert. "We shall return" part TWO will appear in a future AirChat.

Training Tigers

by Jim Davis

Have you ever noticed that the ones who know the least chirp the most? I was shattered the other day to hear a young instructor pointing to a Tiger Moth and expounding to an admiring crowd, on the stupidity of flying such a thing.

"I wouldn't fly one of those crappy cardboard and string things if you paid me" he declared, before tweaking his wrap-around-shades securely into his hair, and strutting across the tarmac to a 172.

I was left staring after him, hoping that he might one day grow up and look back on this proclamation with embarrassment.

Maybe I should have taken him aside and said, "Matey, you are talking about the best training aircraft ever built by anyone in the history of the world. If I were to take you up in that aeroplane now, and set it up in straight and level flight, properly trimmed, and hand over to you, you would lose control within 60 seconds. The 500 hours in your log-book have not even prepared you to taxi that aeroplane. The best thing you can do for your aviation career is go and do ten hours dual in a Tiger."

I believe that ten hours in a Tiger is worth 200 in anything else. It hails from the days when you got good training, even from a bad instructor - one who believed that his only job was to protect the airframe from the student, and let the aircraft do the teaching.

Why is a Tiger such a good trainer? Mainly because it is easy to fly, but extremely difficult to fly well. This means that it is unlikely to hurt you, yet it magnifies your slightest fault. So it's constantly urging you to fly better.

Why did I say that our young instructor would lose control within 60 seconds? Because a Tiger has a powerful rudder that demands precision footwork. It also has a Reid & Siegrist turn and slip indicator. This instrument has one needle pointing down that indicates your rate of turn, and another pointing up that tells of skid and slip. There is no ball.

When a limp-footed 152 pilot tries to fly a Tiger, the rudder soon gets out of centre and this causes the aircraft to yaw and then roll. Because the pilot doesn't understand that this is a rudder problem, he or she will try to level the wings with aileron.

For some reason, which I don't fully understand, the pilot quickly lets the rudder overpower the aileron and the aircraft rolls into an uncontrollable spiral. At this stage the much humbled pilot, if he has any sense, shouts into the Gosport, "You have control!"

Jim with his Tiger that he owned for half a century

Let's take a quick look at what to expect on your first training flight in a Tiger.

You must dress for the occasion - old clothes, because Tigers can get oily. A warm jacket, because you have never been cold until you have been cold in a Tiger. Even on a nice summer's day it can get cold in an open cockpit at 3,000 feet.

You will learn a whole rigmarole on pre-flighting, tickling the carburettor and prop-swinging.

Once the engine is running, and you are strapped in the pilot's seat in the rear cockpit, you will realise that it is impossible to taxi because you can see nothing in front of you. All you can see is a small triangle of ground in front of each wing. Even worse, you should realise that this is all you'll see when you touch down during a three-pointer.

By sticking your head out into the slipstream you can see slightly more, but nothing to wet your pants about. The way to taxi safely is to zig-zag - turn right and stick your head out to the left, then turn left and peer out to the right.

If you don't hold the controls correctly in relation to wind and slipstream, the aeroplane can easily become matchwood.

Pre-take-off checks are pretty standard except it doesn't really matter whether hatches are open or closed (apart from the boot), there are no electrics to speak of - just the mag switches on the outside of the fuselage, fuel is either on or off, and there are no flaps - but you will have to decide whether you should remember to lock the slats.

When you are lined up for take-off you can't see the runway - only the edges. Never fear, things improve soon after you get moving. With full power you need a firm foot on the left rudder (because the engine turns the other way). The tail comes up smartly and suddenly it's a new world - you can see ahead!

You keep the aircraft balanced in the level flight attitude on the main wheels until she drifts into the air at about 45 kts. Now you need to keep her tracking along the centreline with the slip needle in the middle. If you don't notice the slip needle being out, a blast of air will smack one side of your face to remind you that you are flying sideways, and you had better start using your feet properly.

You will climb away at 58 kts and head for a peaceful patch of sky where you can learn the wonders of honest flight.

I am not going to tell you any more because I don't want to spoil your fun. But perhaps I should tell you that the only time you will be in danger in a Tiger is when you think you have mastered the aeroplane.

A Tiger can humiliate the best of us, but it also gives you that quiet confidence that comes from being trained by a professional. It will also improve your handling of all aircraft from that day on.

About the author: Jim Davis has been training civil and military pilots for over 50 years. That includes 15,000 hand-flown hours, of which the majority were instructing. He also has a passion for writing and has columns in flying magazines on three continents and is the author of the best-selling training manual "PPL" (with the intriguing sub-title "A practical book about flying safely") as well as the very popular "Flight Tests" booklet (reviewed in the Summer 2023 AirChat). You can find him at www.jimdavis.com.au.

Three perfect days

by Philip Arthur

In March 2023 my wife Sigi and I flew to the South Island of New Zealand for a holiday. The original idea was just to join a group of friends on a cycle trip along the Central Otago Rail Trail but it gave me the perfect opportunity to tick off a bucket list item.

I'm always on the lookout for challenges that both improve my flying skills and are fun. Some years ago, Dan Pearson, a member of the Club, did a one-day mountain flying course at a flying school called "Learn to Fly NZ" in Wanaka, about one hour's drive from Queenstown. Dan wrote up his experience for a 2017 edition of AirChat and inspired me to do something similar. I'd visited the South Island numerous times for work during the 1980s and 90s and had good memories of the region and thought how cool it would be to fly there and see it all from the air. So, after being invited on the cycling holiday in Otago, I looked up Dan's story in the old edition of AirChat and contacted https://www.learntoflynz.com/. We had plenty of time so I booked myself in for a three-day mountain flying course. It seemed that three days would give me enough time to learn the basic skills for flying in the mountains and visit a few spectacular spots while not costing the earth. Little did I know that it would exceed all my expectations.

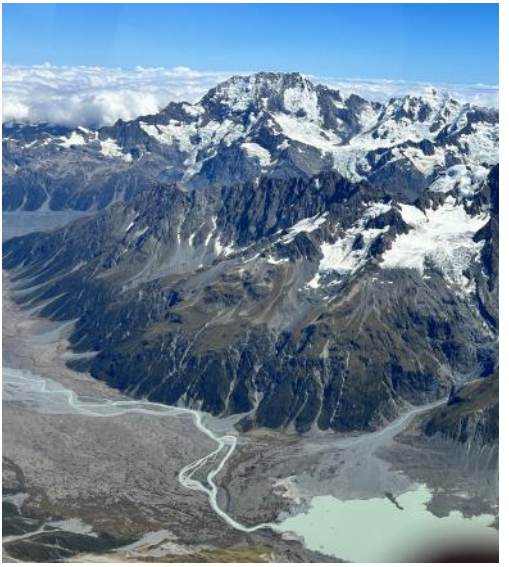
We arrived in Queenstown on 1st March. We knew we'd arrived because the Virgin pilot provided us with a rather "firm" landing, and I said to Sigi "I hope I don't do any like that while I'm on the course." We headed straight over the Crown Range to Wanaka, where we'd booked a motel for four nights. As we climbed up the Crown Range we had a view back down the valley and straight down the runway at Queenstown Airport.

The next morning I drove the 10 minutes out to the airport and met up with instructor Karl Hillary at 8:30. Karl was a local who'd been working for the company for only 12 months but appeared to know a bit about mountain flying as he took me through an interactive PowerPoint presentation. He explained basics like never fly up the middle of a valley, keep to one side (preferably the right but it depends on the winds) so you have as much room as possible if you want to turn around. Fly on the side with the updrafts to give you additional lift and watch out for turbulence and rotors on the lee side when you fly over a ridge or pass. Approach a ridge at 45 degrees so you can turn and fly away from it if you decide you might not make it over. And so on. There was about an hour of classroom instruction before we headed out to the aircraft, a Cessna 172N ZK-MDR with a STOL modification on the leading edge of the wing and a touch screen Garmin G3X glass cockpit.

After a short taxi out to RWY29 we took off and turned to the east, where we tried some basic turns. Karl was illustrating how tightly a 172 can turn at 100 knots so I had a bit of an idea how much room we'd actually need in a narrow valley. Then it was off to said narrow valleys where I practised flying as close as possible to the right-hand wall and then turning 180s and 360s. From there we flew north over a couple of passes and Lake Pukaki to Mount Cook. It was perfect conditions. Clear blue sky and a bit of wind to create some updraughts and downdraughts.

Approaching Mt Cook, Karl told me we could legally fly above 10,000ft and up to 13,000ft without supplementary oxygen for up to 30 minutes. It would allow us to fly higher than the peak of Mt Cook (12,218ft). Soon we were climbing, climbing, climbing up over the Mt Cook airstrip and past the Heritage resort to get a magnificent view of the mountain and its glaciers.

View to Queenstown from the Crown Range Road



Mount Cook above and Lake Pukaki below

It was a pleasant flight back, following a variety of valleys and crossing a number of passes, approaching Wanaka from the north over Lake Hawea. End of Day 1. It had been a great day.

On Day 2 I had another instructor, Austin. Austin Jones had been flying out of Wanaka for about eight years. Karl had told me that Austin knows every valley and mountain pass intimately so would be my best guide for the two remaining days of the course.

Austin outlined the plan for the day. There was a bit more cloud than on Day 1 which would be good for learning how to judge which valleys to fly down and which passes we could (or couldn't) make it over. We'd fly west, over the famous Skippers Canyon and the northern end of Lake Wakatipu, and head south over Lake Te Anau to Manapouri. After a lunch stop we could fly over to the west coast and up the coast to Haast and then try to fly back inland over the Haast Pass. Great plan.

Austin also introduced me to gopreflight.co.nz, the local flight planning tool. It allowed me to check the area weather, TAFs etc.

I also logged into aip.net.nz, where you can find the NZ version of ERSA, aerodrome diagrams, instrument approaches and departures and other operational data.

Lake Wanaka above and Lake Wakatipu below

Taking off over Lake Wanaka we had spectacular views of the town and the surrounding mountains and were soon at about 5000ft over Skippers Canyon and the Shotover River, with a clear view of the southern arm of Lake Wakatipu in the background. The Skippers Canyon road is notorious for its sheer drops to the river below as you can see in the photo (left). It was originally built to allow access to gold mining areas in the canyon.

From there we dodged some cloud and avoided another light aircraft that was climbing through the valley below us and were soon passing over Glenorchy at the northern end of Lake Wakatipu. Avoiding the controlled airspace around Queenstown we flew via various valleys and passes to Lake Te Anau and Lake Manapouri where we landed for lunch.

Skippers Canyon

Taking off to the north, we flew to the northern end of Lake Te Anau and then followed the Hollyford Valley to the coast. It was one magnificent view after the other even with the increase in cloud cover. It was in fact becoming gradually more difficult to avoid the clouds but Austin was confident that we'd find our way so on we went and popped out on the west coast at Martins Bay, home to a rather exclusive flyin resort for people who want peace and quiet and maybe a bit of fishing.

Mount Aspiring

Flying north along the coast Austin pointed out Big Bay and the inlets that pepper the coastline and in about 20 minutes we were over Haast, a small settlement on the coast. It's at the end of the road over the Haast Pass, the only land-based route from Central Otago to the west coast. The clouds were BKN at about 2000ft by now, so we cautiously flew inland, up the valley, following the road, searching for a gap in the clouds. Finally Austin decided it was a lost cause and announced we'd fly back along the coast and find another valley to head inland. Retracing our steps, we made it to the Hollyford Valley and climbed between the clouds and finally made it over a pass. On the eastern side of the main range the sky cleared. We were back in SCT to FEW descending back over Lake Wanaka. The end of another perfect day.

When Day 3 dawned, the clear blue sky beckoned as Sigi and I drove to the airport. Austin was ready and waiting. He told us the plan was to fly via a number of valleys and passes to the coast and then south to Milford Sound. We'd land there for lunch and then consider where to from there.

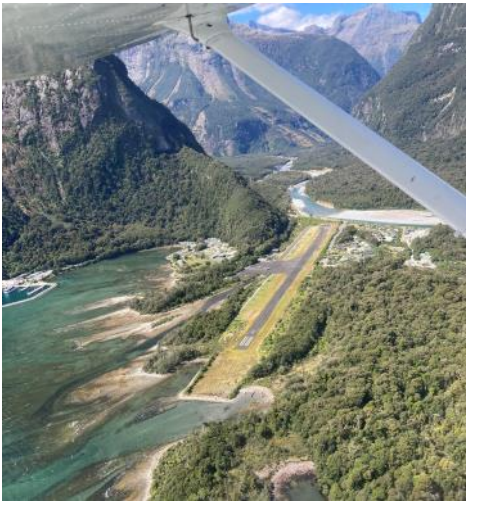
This time Sigi would fly with us, as she was keen to see Milford Sound and soon all three of us were climbing out over Wanaka once again and heading to the west coast, this time wearing Hutchwilco life jackets. These are made in NZ and are probably the best ones I've worn. We needed them as we'd be landing and taking off over the water at Milford.

Taking off to the west again, we had amazing views of Mt Aspiring and various glaciers as we climbed out.

After negotiating numerous valleys and passes we reached the coast where, after flying a further ten or so miles south, we descended to 2500ft for the flight into Milford Sound. We hugged the southern side of the valley past Mitre Peak and descended to 1000ft. With an easterly wind blowing up the sound from behind, we'd have to turn and land into wind from the 'mountain end'.

Austin explained how I'd have to join downwind just to the right of the Milford strip and head directly for the mountains, then turn 180 degrees in the valley behind and align ourselves with the runway to land to the west. He coached me all the way through the approach, while Sigi did some Hail Marys in the back seat. During the approach it was a bit gusty, with some slight turbulence and, being surrounded by jaw dropping scenery, it was breathtaking in more ways than one!

Milford Sound airstrip



A five minute walk led to the cafe where we ate our lunch and observed all the other day trippers who had mostly come in by ground transport. We felt very fortunate to have been able to fly in.

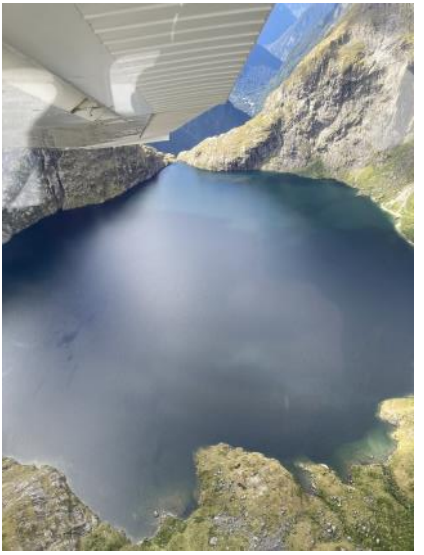
It was the sort of day that pilots dream of. It's why I learned to fly. A perfect day in Milford Sound, which is renowned for its many not-so-perfect days.

Soon we were back at MDR, donning our life jackets and starting to prepare for departure. As we taxied out Austin told me that after takeoff I should "hug" the mountain on the right side of the sound to maximise the lift. We lifted off and I flew close to the cliffs, having now become fairly used to being close to mountain sides, and we caught an updraft that had us climbing at 2000ft/min. Not bad for a 172.

Reaching 5000ft, we banked left and passed Mitre Peak and entered the Arthur River Valley. Climbing steadily, I could soon see a waterfall that was spilling out over a ledge before us. It was the 580 metres high Sutherland Falls. Continuing to climb, we passed over the top of the falls and entered a circular crater that contains Lake Quill, a brilliant blue alpine lake.

Austin wanted to demonstrate how good the 172 is at getting out of tight corners in the mountains so he told me to aim for the left-hand side of the crater and wait for his command before starting to turn. When we were really close to the cliff (Sigi saying more Hail Marys in the back seat) and a couple of "wait for its" from Austin, he said "Ok, start a gentle bank to the right". I banked right and put in some rudder but as I tried to turn the yoke a little bit further noticed I couldn't bank any more - Austin's knee was (purposely) blocking his yoke (and therefore also mine) from turning any further. We were doing a 15-degree bank and he didn't want me to bank any more. He said that was plenty and sure enough we managed to stay far enough away from those cliffs to our left as we circumnavigated the lake.

Milford Sound



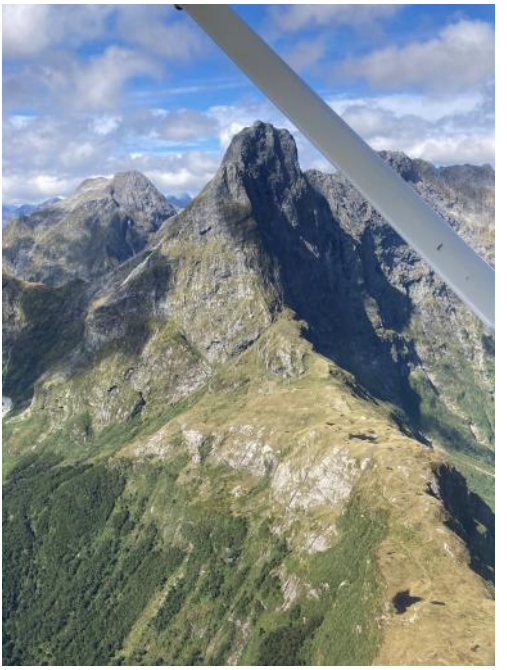
Lake Quill

Completing the 360 degree turn, and having thus proven Austin's point, we headed back over the edge of the Sutherland Falls as the ground dropped away to the valley floor 600 metres below.

Banking right, we headed over the Mackinnon Pass (3,800ft) where we could just make out one of the huts used by walkers on the Milford Track perched on the ridge.

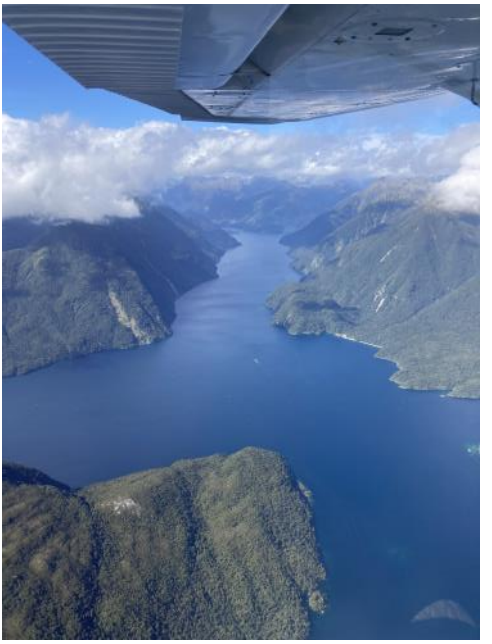
Sigi had originally wanted to catch a bus to Doubtful Sound that day but they'd been booked out, so she'd decided to come flying with us instead. Austin suggested we fly on to Doubtful Sound so she didn't miss out. He gave me the task of planning a route through the valleys west of Lake Te Anau to the coast, while avoiding clouds and mountains. I chose one with a pass height of about 2000ft at its end and made our way up and over, dodging clouds and staying on the windward side of the valleys to catch the updrafts as we went.

Fifteen minutes later we were at the coast heading south towards the mouth of Doubtful Sound. Flying into and along the sound all the way to Deep Cove proved to be another dramatic spectacle.



Mackinnon Pass

Doubtful Sound

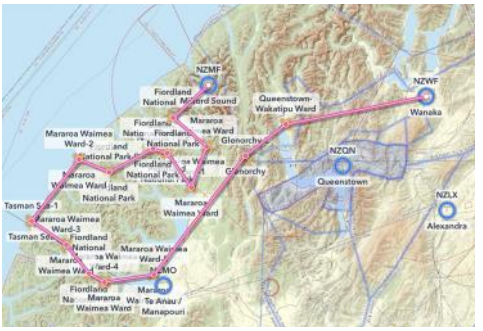


After flying over the pass at the end of the sound we were approaching Lake Manapouri when Austin said “Oh it’s later than I thought. We’d better head back home asap. Climb to 9500ft so we can fly direct to Wanaka!”

Passing over Lake Te Anau we did a bit of a dog leg to avoid the controlled airspace west of Queenstown then crossed the northern end of Lake Wakatipu before descending over Skippers Canyon and the rugged mountains around the Cardrona ski field on the way back to Wanaka.

We joined midfield crosswind to land on RWY29 at Wanaka. The end of another incredible day’s flying.

Thanks to Austin, Karl and LearntoflyNZ for the three day course that worked out better than I’d ever imagined. The most amazing flying experience of my life. We just don’t have anything like it in Australia. To fellow aviators I cannot understate how much fun the course was. I recommend it highly to anyone interested in challenging both their flying skills and themselves in such a beautiful part of the world.



Why fly a stabilised approach?

by Rob Knight

Rob Knight grew up in New Zealand in the 1950s and 60s with a crazy urge to fly. He became a flight instructor and worked in the industry for many years, eventually as Chief Pilot/Chief Flying Instructor for the Wellington Aero Club. Rob is now retired and living near Amberley. He is the editor of the BVSAC Flyer, the magazine of the Brisbane Valley Sport Aviation Club based at Watts Bridge.

I have seen/read many pieces on how to make good landings in an aeroplane. Mostly they were worth the time to read them, but a few were merely to allow the writer to expound dubious and random thoughts that were scarcely relevant. The good ones mentioned the need to start a landing process (at the point of flare) from a "stabilised approach". However, the general definitions relating to the term are designed to fit commercial operations and IFR ops rather than fun-flying in lighties under VFR rules. So, is the term even relevant to us flying light, single engine aeroplanes?

The answer is an emphatic, YES! But there are qualifications - so let's have a look at the term and its application and benefits to us.

Firstly, let's define what we are talking about. A stabilised approach for us is one where the approach is at a relatively constant angle, the airspeed is constant at the required value, and where the directional control inputs have the runway in the correct position in the windscreen for the wind conditions, and the approach/landing technique being used.

I can hear a rising wail of protest - "But I always make my approaches like that" - ringing in my computer. And, YES, I agree that we do, when

1. The circumstances and conditions are normal; where we are not under undue (and likely unexpected) pressures, and
2. the traffic conditions are favourable.

Note that the continuation of an unstabilised approach when landing may result in the aircraft arriving at the runway threshold too high, too fast, out of alignment with the runway centre-line, incorrectly configured or otherwise unprepared for the intended landing. The result is obvious - aeroplane damage due to non-fully-controlled touch-down, loss of directional control leading to runway departure, and, potentially, injury to persons, or damage to the aircraft or airfield installations.

However, in regard to any pilot's potential for making an unstabilised approach, herein lies a serious trap. Pilot competency, proficiency, and currency are all jokers-in-the-pack that every pilot flies with as these factors can have a major influence on a pilot at the most inconvenient place and time. Making a good, stable approach is potentially one way of ensuring an approach does not become one of those inconvenient times.

Taking a common example of training to avoid this issue, when you were taught to fly circuits, you were most likely taught to set the aeroplane up for the approach either at, or soon after turning base leg. In other words - at the beginning of the descent. This taught you to make a stabilised approach, as you had plenty of time to sort out the approach angle at the correct airspeed, and with the correct power applied for the desired angle, and with the aeroplane trimmed for no stick pressure. This method gives you plenty of time to make any necessary changes to compensate for atmospheric issues along the descending flight path to arrive at the flare at the desired point on the runway, without being stressed. As long as this procedure is being strictly adhered to, there is unlikely to ever be a problem. But humans will be humans, and that's a problem for some but more of that, later.

Now, take a professional light aircraft pilot - one who flies the aircraft for a living. He's not a "fun" pilot, as many light aircraft pilots are. As an instructor, he may spend a mere 30 minutes driving to and from the airfield, but up to 6 hours daily logged as flight time in an aircraft. An AG pilot will do even more than that when the weather is clement. For example, my logbook shows one period, in 1973, where I flew 54.8 hours over a 5-day period doing a flying scholarship exercise for the International Scouting Foundation Jamboree, at Tokoroa in New Zealand. With this sort of practice forced on you, you can stabilise an approach in 2 seconds at 100 feet if required.

Now I fly for fun. I don't have the pressures of "the next student" booking, or the next hopper-full of fertiliser to load, so I am back to stabilising my approaches earlier than as I turn finals at 50 feet AGL. To do so, I'd need a lot of practice and the need to do it so now I am happy to sort the aircraft out when I turn base, as I would have my students do. However, should I ever need it, in the unlikely event of a fire in the air perhaps, then rest assured that I'd be right there at 50 feet again, closing the throttle, adjusting flaps and trimming, simultaneously, whilst, at the same time, I am planning on exactly where to roll out of the turn so I can be lined up with my required landing path. Obviously, to successfully do this, I simply cannot afford to make a single mistake because I have no time to see an error, decide how to fix it, and then apply the controls to remedy the error whilst also flying the aeroplane successfully in the remaining 20 seconds or so before my wheels touch.

But EVERY PILOT IS DIFERENT! No training course or rating/endorsement is available to qualify a pilot for carrying out unstabilised approaches so pilots can only self-qualify, and this has obvious and serious issues inherent with it. A pilot MUST have a realistic idea of their actual capabilities and pilots are not renowned for accurate self-analysis. To compound this, parameters change over time, modified by time since qualifying, currency/recent flight experience, and total/recent flight experience on the aircraft type being flown.

What are the benefits of a non-stabilised approach? None, except a small time saving, there is no benefit to the average flying-for-fun pilot. There's no advantage for an instructor, either, for that matter. It's only setting a hellava bad example to the student. The only pilot to whom this type of approach is a good idea is crop-dusting. When spreading solids, in my time a 3-minute turn around between sorties was normal and we often flew up to ten operating hours in a day. That's 20 approaches per hour and a grand total of 200 approaches for the day. To save 20 seconds per approach saves more than an hour every such day (1.1 hours, actually) and we were paid a bonus for getting the job done in less than the standard or quoted time. At a standard payload for my Fletcher of 610 kg. Therefore, if we spread 610 kg every 3 minutes (20.5 trips), another 1.6 operating hours in a day equals an extra 12.5 metric tonnes per day. This paid bonuses. However, unless you are extremely current, have several thousand hours of recent flying in your logbook/s AND a tangible benefit is doing so, avoid unstabilised approaches. The only benefit would be in the level of your showing off, and, if you miss, the embarrassment of public failure when doing so.

The hazards of not flying a stabilised approach can be easily seen in the following accident examples. Note that none had bad weather conditions.

In 1978, a Piper PA-24 Comanche was transiting the controlled airspace between Auckland International Airport (Mangere) and Ardmore, a lateral distance of a mere 8nm. I was in the Ardmore circuit for runway 21 in a Victa 100 with a student when I heard the aircraft's joining call. I knew the pilot - we'd flown BFRs over the years and I'd never had issues with his competency.

Rob in his Fletcher in 1970

It was late in the day and he was in a hurry. The runway in use was 21 and the control tower offered him a straight in approach for 07. There was minimal wind and he made a good choice of accepting their offer. I looked and found him, low and fast, about a mile short of the threshold and as we turned final for 21 he touched down, leaving a trail of white-painted, shredded aluminium behind him - his wheels were still retracted. Later it was shown that the propeller was set for cruise RPM so adding power to go-around would not have necessarily been without issue either.

Result: Big red face, big, Big embarrassment, and big, Big, BIG increase in insurance premium, plus the loss of the PA-24 for several months.

In a Cessna 152, engaged in a CPL cross-country flight test for a budding commercial pilot, I noticed that the pilot wandered off track on the leg from Tauranga to Hamilton, in New Zealand. As examiner, I was required to sit and watch, no law had been broken and there was no danger in the error so no action was required from me except to assess the pilot and his subsequent actions. To his credit, he did recognise the issue and made the appropriate 1 in 60 rule calculation and revised his in-flight nav plan. However, he never settled down again and was still agitated when we advised the Hamilton tower that we were 5 miles and gave a circuit join time. The tower responded by giving him clearance to join down-wind for 36, the main, bitumen runway.

The pilot declined, and requested clearance to join right base for grass 25, the cross runway. The tower, sounding surprised, cleared him, advising him there was no other traffic and advising the surface wind which indicated that we'd have a substantial cross wind.

Ever the mere observer, I sat and waited for the disaster to unfold. He stuffed the nose down and eased the power, diving onto right base and turning finals low and fast while doing his down-wind checks. About 100 feet short of the fence, drifting seriously and uncorrected to port, he applied carb heat and closed the throttle. He waited for the airspeed to fall below V_{FE} with his hand on the electric flap control (still drifting and now nearing the left side runway margin), watching the ASI rather than what was happening just outside the cockpit. On reaching V_{FE}, he applied full flap and banked towards the centre of the runway. He was trying to trim, his right hand frantically jerk-winding the trim-wheel as the right wheel hit the runway and we bounced. He decided we needed to go around but still had carb heat on and, instead of hitting the power and then sorting out the heat control, he looked down and pushed the carb heat to OFF. We bounced again, harder this time, on both wheels, but the airspeed was falling rapidly and the next impact, if it occurred, would be damaging at best. I had no option but to take the aeroplane off him, and ever-so-gently, effectively carry out a full-flap stall recovery at 20 feet. After flying it away, I directed him to call the tower and join downwind in the conventional manner. Later, he could give no reason for his unconventional approach method.

Result: Big red face, big, big embarrassment, and bad, undesirable and permanent remarks on the flight test report I was required to submit to NZCAA outlining my decision to fail the candidate. These reports remain attached to a pilot's CAA file for as long as that pilot holds a license.

Moral of these stories: WHY carry out an unstabilised approach if there is absolutely no practical advantage, and a seriously raised chance of a mishap? A competent pilot gives him/herself time to ensure that their aircraft is set up correctly, and they have time to counter unanticipated issues.

I rest my case.

Loss of control

A new three part video series from RAAus

Every year in sport and general aviation, loss of control events are the single most significant contributor to serious and fatal aircraft accidents. RAAus in collaboration with numerous pilots, instructors and aviation experts completed production of a three part video series about loss of control earlier this year. The videos, freely available on their website, explain the primary causes and contributing factors of these avoidable situations that can lead to serious, costly or even fatal consequences. The videos delve into a variety of situations and how to avoid loss of control as it occurs:

1. During take-off
2. In flight, and
3. During landing.

Filmed in and around Redcliffe, the videos feature a few well known faces who talk about various scenarios and actual accident victims who describe how things went wrong for them. It's a very well made series that should be watched by all pilots.

Click on the link below to view the videos.

Loss of Control - RAAus

Engine management made easy

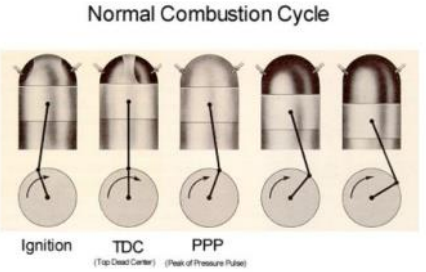
or "what is WOTLOPSOP"?

by Philip Arthur

Over the weekend of 29th- 30th October 2022 I attended a two-day workshop on engine management that was run by Advanced Pilot Seminars (APS). Originating in the US, the main thrust of the course is to instruct pilots who already have some flying experience how to fly more economically and at the same time in a way that is more likely to ensure longer lives of their engines and result in longer times between overhauls.

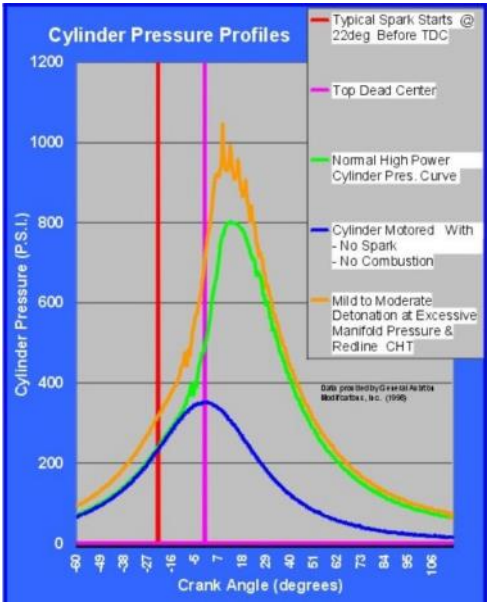
A main focus of the course was optimising the fuel:air ratio in the engine. Basically you can run an engine rich (excess fuel) or lean (excess air) or neutral (stoichiometrically balanced mixture of fuel and air). The typical way to monitor whether you are rich or lean is by monitoring the exhaust gas temperature (EGT). It is measured on each cylinder on many modern light aircraft including our Club's 172s and 182s with G1000 systems. A thermocouple is placed in the exhaust gas manifold as close as practical to each cylinder exhaust port. The EGT is displayed on an engine monitor in the instrument panel, normally as a series of bars in a bar graph. The image below shows the EGT bar graph in the centre of the Cirrus Perspective engine monitor display. In a similar fashion the temperature in the top of each cylinder (Cylinder Head Temperature - CHT) can be displayed as shown on the left below.

We first revised the four stroke cycle of the engine with each cylinder passing through intake, compression, combustion and exhaust. We learned how the pressure in each cylinder climbs as the air+fuel mixture is compressed and then ignited by the spark plugs.



The aim is to ignite the mixture so that you have a smooth flame front travelling out from each spark plug over the cylinder head, translating into a maximum pressure on the piston just after it reaches top dead centre (TDC) and starts to travel down once again. The pressure that's caused by combustion then forces the piston down, driving the crankshaft and hence the propellor. The peak internal cylinder pressure coincides with the peak cylinder temperature. You should optimise both of these parameters for long engine life while obtaining optimum power from the engine. One factor that influences the efficiency of the combustion is the timing of the spark and this can be adjusted to suit the particular engine and situation. If the timing is too early there can be detonation, which may lead to engine damage. If too late, there will be reduced efficiency and potentially wasted fuel.

The traces in the graph below show how the cylinder pressure can vary depending on when the spark ignites the mixture. The blue line is the trace if there is no spark and no combustion. The pressure increase is purely caused by the compression of the gas mix by the piston. The green line is with normal spark and combustion with a maximum pressure of about 800 psi. The yellow curve is the result of advanced ignition, insufficient octane rating or some combination of factors that leads to moderate detonation and higher cylinder pressure of up to 1000 psi.

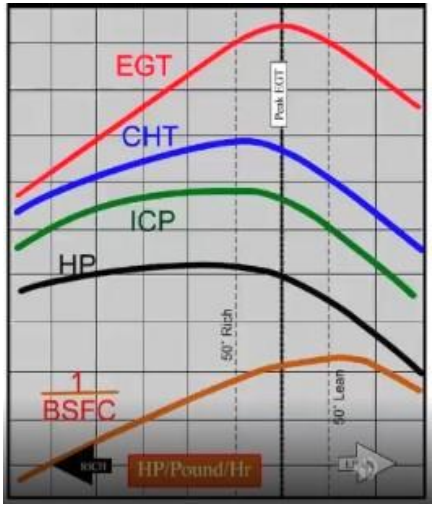


Another factor is the fuel to air ratio, as it can also affect the engine performance. Exactly where you want to operate depends on whether you want maximum power or maximum economy and this is where it becomes somewhat controversial. Do you want to run with a richer mixture or a leaner mixture? When does the peak EGT occur? What is the difference between running rich of peak (ROP) and lean of peak (LOP) and how do you operate one way or the other? Also how are parameters like CHT, Internal Cylinder Pressure (ICP), Exhaust Gas Temperature (EGT) and Power (HP) affected by changing the ratio of fuel to air?

With AvGas burning in air, complete combustion should theoretically be possible if the mass ratio of fuel to air is approximately 1:15. So, for every one kg of fuel, you need 15 kg of air to burn it. In reality you need a bit more air due to combustion inefficiencies but let's not worry about that.

One way to determine whether you're lean or rich is to construct a graph like the one below. The x axis is the ratio of air to fuel while the y axis is the temperature/power/efficiency. It shows the variation of EGT, CHT, ICP, HP and 1/BSFC (Brake Specific Fuel Consumption, a measure of efficiency), with air to fuel ratio.

The richer mixture is on the left and leaner mixture on the right. As you 'lean' the mixture (move from rich to lean i.e. from left to right) all the parameters initially increase and then decrease. The peak of each curve occurs at a different ratio, however. We define the demarcation line between rich and lean mixtures as peak EGT. If you either add more fuel to the peak EGT mix or remove fuel, (or add air or remove air) the EGT will decrease from that point in either direction. Why? If you make it leaner by reducing the fuel rate, there is less fuel to combust so the average gas temperature will be lower. If you make it richer by adding more fuel, there will be some unburnt fuel that must be vapourised and heated but won't combust. In the process of heating and vapourising it will absorb some of the heat of the flame from the combusted fuel and the average gas temperature and hence EGT, will also decrease.

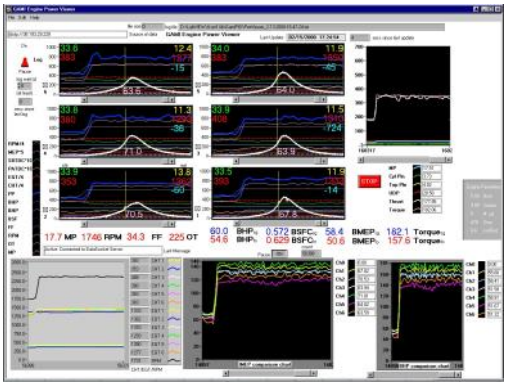


In the case of peak CHT, if you make the mixture leaner or richer you slow the rate at which the combustion event happens. In a slower burn the piston will have travelled further down the cylinder by the time peak pressure occurs and the resulting peak pressure will therefore occur in a larger volume of space and as a result the peak pressure value will be lower. It is this lower peak pressure that results in cooler cylinder head temperatures. The relationship of ICP and CHT are in parallel and track each other across the graph.

With development of aircraft engines after World War II, two major manufacturers of light aircraft engines in the USA were Continental and Lycoming. Most manufacturers focused predominantly on running their engines with rich mixtures, despite knowing that lean mixtures were optimum for cylinder temperature and efficiency. The problem was they couldn't easily make them run smoothly in all applications when running them LOP and so decided it would be prudent if all light aircraft engines were to run rich of peak to ensure smooth running and wrote as such in their operating manuals. It would result in higher fuel usage and possibly higher cylinder pressures and temperatures, but they reasoned it would be easier to avoid problems with poor fuel air ratios between cylinders if the engines were not run lean. This was especially the case where the air:fuel ratio varied from cylinder to cylinder due to differential pressure drops in the inlet manifolds. A standard fuel injected engine uses identical fuel injectors in each cylinder, meaning that similar fuel rates are injected into each cylinder even though the air rate is different. This leads to differential mixtures, that in turn leads to different peak EGTs and peak CHTs between the various cylinders. In the days before modern engine monitors were invented there was no way of telling this was happening and accurately evaluating where the peak EGT was, so the aircraft POH's instructed aircraft owners to run rich of peak. This type of guidance continues to the present day in many POHs.

With the advent of digital engine monitors in the 1990s, some people in the US decided that LOP might be a better way to run an engine. They argued that by measuring the engine parameters precisely it would be possible to run smoothly while LOP, thereby saving fuel and putting less stress on the engines. A business called General Aviation Modifications Inc (GAMI) was founded to assist aircraft owners to operate their engines in this way. They developed an engine test facility in Ada, Oklahoma that plots very precisely how the parameters change with a change in throttle and mixture position. It allows GAMI to compare different cylinders in an engine and then design custom made injectors (called GAMIjectors) that ensure a controlled and even ratio of fuel to air in each cylinder. They've developed a test procedure that aircraft owners can follow (if they have an engine monitor) and if the owner delivers the results to GAMI they'll deliver custom made injectors to replace the ones in their original Continental or Lycoming engines.

Despite it being over 20 years since the idea of running LOP during the cruise was raised as a potential operating procedure, there appears to still be a bit of controversy among aviators and engine manufacturers around whether you should run aircraft engines LOP or ROP. The engine manufacturers still promote running rich of peak and that's what's taught to students at many flight schools. Although that may be all right to simplify matters for student pilots, APS believe that it's too simplistic and leads to poorly run engines that need more maintenance more often. While the manufacturers may argue that it's too difficult for your average GA pilot to run an engine LOP, APS believe that by using modern engine management systems with digital technology to measure the key performance indicators in the engine, pilots of piston driven GA aircraft can easily operate LOP. In fact APS believe if you are competent enough to run rich of peak properly, you can also run LOP properly. The bigger issue is many pilots may be running rich of peak but not running rich enough and they don't realise it. If there is to be a state at which engine stress is created it is running rich of peak but not rich enough.



My takeaways from the seminar

Terminology

A mixture that is anything richer than peak EGT is not lean, it is rich. It may be "less rich" than a richer mixture but it is not lean. Only when it has a lower fuel:air ratio than that at peak EGT is it lean. This is important when explaining how to adjust the mixture. You may be trying to make it less rich but not trying to make it lean.

Continental and Lycoming engines have some differences

In Continental engines the fuel pump plays an integral role in determining the mixture ratio. As the engine RPM changes so does the speed of the fuel pump so the fuel delivery rate changes. This change in fuel rate will affect the mixture ratio. In a typical Lycoming fuel injection system, however, the mass airflow determines the fuel flow, so the fuel pump plays no role. The mixture should remain reasonably constant irrespective of the RPM and manifold pressure.

Internal Cylinder Pressure is an important parameter

Internal cylinder pressure peaks just rich of peak EGT. This is also the point at which the highest temperature exists in the cylinder. Given that PV=nRT (Boyles Law) and if the volume and number of reacted molecules is constant then if the pressure is high then the temperature must be high too. This point of high temperature and pressure is what we should try to avoid for extended periods in order to increase engine life. High pressure and temperature can lead to damage of cylinders, piston heads, rings and cylinder heads. The question is how to avoid high pressures and temperatures while still obtaining sufficient power from the engine. The secret seems to be in the timing of the spark plug firing. If you get the timing right you will have the maximum power right when you need it, when the piston has started on its downward stroke. If the timing is too early, you'll get a higher peak pressure and temperature that will cause unnecessary stress on the engine components without adding to engine power.

Starting the engine and taxiing

When you start the engine, you'll start it full rich as it aids the ignition process. To avoid a build-up on the spark plugs you should adjust the mixture to make it less rich, until the maximum RPM is achieved, and then make it a bit less rich. You can taxi like this and it will reduce the likelihood of the spark plugs being fouled with deposits that can make rough engine running and reduce power when you need it most (at take-off).

Once you're ready to do your magneto checks you should then enrichen the mix slightly before you switch the mags.

Take off and climb out

You should take off at full rich if you're at sea level, or at maximum RPM if you're at altitude. Keep the boost pump on to avoid problems with fuel vapourisation. Once you're established in the climb, maybe at 1000-2000ft, check the EGTs on your engine monitor. They should all be somewhere around 1300 degF. During the climb, keep your throttle wide open and gradually adjust the mixture, making it less rich as you increase your altitude and the air density decreases. You should maintain roughly the same EGTs throughout the climb until you reach cruise altitude. While you'll remain rich of peak, this procedure, using EGT as your guide, should help to operate at the best mixture ratio for maximum power during the whole climb and should be easier than hunting for a particular fuel flow rate at various altitudes.

Cruise

Once you level out, you let the aircraft accelerate and then you can switch off your boost pump, adjust your throttle if need be to find your desired airspeed (but you can leave it wide open throttle (WOT) if you want to). If you then want to fly at best economy do a 'big mixture pull', adjusting the mixture steadily through the peak EGT values to arrive at a fuel flow rate that is somewhere around 50 degF LOP EGT. Once there, if you're pedantic, you can check exactly how many degrees you are LOP EGT if you richen the mixture back towards peak EGT very slowly, making it 'less lean' and waiting for the first EGT to peak. Once there, you note the peak temperature and lean it back to about 50 degF less, to arrive at about the most economical cruise mixture. There's nothing stopping you from leaning it further and it won't damage the engine if you do, but approximately 50 degF LOP is about where the most efficient engine operation is, so you'll be achieving less miles per gallon if you continue to lean past that point. If you are flying a normally aspirated engine this 'delta T' varies. At lower altitudes 50-80 degrees LOP is appropriate, while if you are at 8000-9000 feet maybe 10-20 degF is more appropriate.

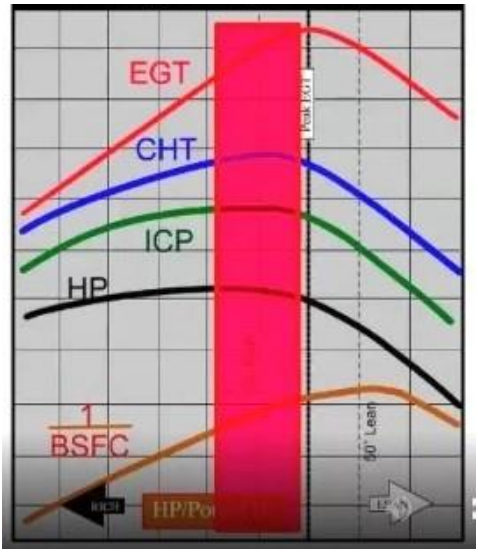
The red box

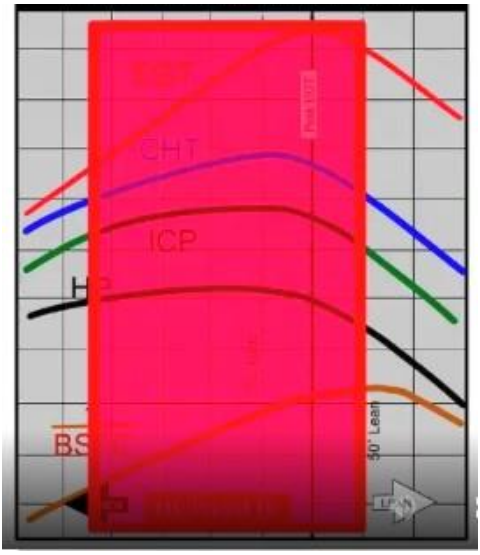
Some instructors may teach that you should lean the mixture slowly to find the peak EGT. APS disagree with this methodology. They argue that the most dangerous way to run an engine is anywhere from peak to about 50 degrees rich of peak EGT, depending on the power setting, as that is where you'll get the highest internal cylinder pressures and therefore the highest CHTs. That is what will decrease engine life. Detonation is also more likely to happen in that area. It is even more critical on turbocharged engines, where prolonged exposure to these mixtures heats up the engine towards the point where some detonation might begin. So APS argue that you should pull QUICKLY from maximum power to appropriately LOP to avoid that danger area. They call the danger area the 'Red Box' and draw it as such on their graphs.

The graphs below show how EGT, CHT, ICP, HP and efficiency (1/BSFC) vary as the mixture is adjusted from rich on the left to lean on the right. The area covered by the red box should be avoided except for transient changes. The figure below left is at 65% power. As the power increases so does the size of the red box so that at 75% power it appears as below right.

There is still controversy surrounding operation at LOP but it appears that the engine manufacturers may still be avoiding discussing how to run their own engines in the best way. I went to a short talk about running LOP at Oshkosh in 2019 and then had a discussion with a Continental engine specialist afterwards who was dead against running LOP. The reason the engine manufacturers don't want to run LOP seems to be a mix of conservatism (probably supported by legal opinions) and their feeling that pilots are not able to control an engine using something like an engine management system. That really comes down to training. If the pilot isn't trained properly then it may be best if they stick with a rich mixture, but if trained properly it seems to make more sense to run the engines LOP whenever you can.

The Cirrus SR22 POH instructs pilots how to run their Continental engines LOP for best economy in cruise or ROP for best power. Running LOP (best economy) can save a few gallons per hour of fuel while only reducing cruise speed by a few knots.





Do a mag check at top of descent

The common method taught during training is to do a magneto check during your taxi before take off, and to watch for an RPM drop as you switch from one mag to the other and back to both. The aim is to detect whether there are any problems with the engine before you take off. This procedure doesn't really tell you much however, apart from if most or all of your spark plugs are fouled and need to be cleaned by running lean on the ground for a minute or two, or that one magneto is inoperative. A more likely danger is that one or two of your spark plugs is damaged and you won't be able to see this by watching the RPM alone. What if one spark plug on each magneto is damaged? There will be no noticeable difference in RPM. APS suggest you still do this mag check before takeoff, but that it's way more useful to do a mag check in the air, just before you start your descent.

The idea is that you'll be leaned out to cruise mixture setting so if there is a damaged spark plug you're more likely to notice it. If all the plugs are firing properly, you should see all the EGTs increase evenly when you switch off one of the mags. This is due to the slower combustion caused by a single combustion source in the cylinders, and a slower burn means a much lower pressure and less expansion of the gases and thus less cooling of the gases. If one of plugs is not firing, however, that cylinder's EGT will decrease when you switch to the single mag and then increase again when you switch back to both mags. They say you should take your time on the mag check. Switch to left and wait for 20 seconds to watch the EGTs rise then switch to both and watch them fall. Then switch to right and wait for another 20 seconds to watch the EGTs rise again.

APS argue that if you do the mag check at the top of descent and notice abnormal responses, you'll be able to descend safely and land but you'll have the added advantage that you'll be able to go straight to a LAME workshop and ask them to check the suspect cylinder straight away. Hopefully they'll detect a damaged spark plug or lead and be able to replace it for you so you will have the problem fixed before you have to fire the plane up again for your next flight. Apparently, RPT pilots of piston engine airliners like Constellations used to follow this sort of procedure so that they could pick up any ignition related issues each time before they landed and could have them investigated straight away.

You don't need to enrichen slowly on descent

You generally don't need to enrichen your mixture slowly. If the CHT is less than 380F to start with you can't damage the engine by going straight to full rich. A normal cool running engine is not able to be 'shock cooled'. It's more likely that overheating by very aggressive climbing at low airspeeds and high power leads to engine damage, for example, in glider tugs and skydiving planes.

Optimum CHT range

CHT should preferably never be more than 380degF and not less than 240degF. You should set an engine alarm at 400 deg F so that if it ever gets that high you adjust the mixture or throttle back to bring it down again. A high CHT means you have high internal cylinder pressures and can lead to detonation and serious engine damage.

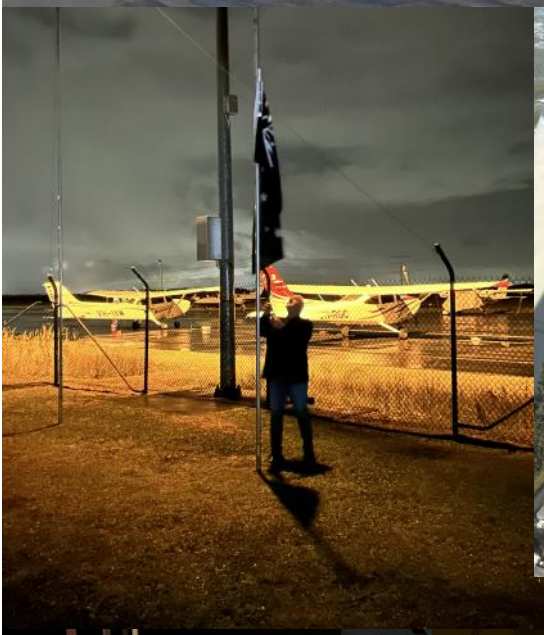
And APS argue that as long as your CHTs are within that range, there's nothing wrong with cruising at more than 75% power - Wide Open Throttle (WOT).

WOTLOPSOP

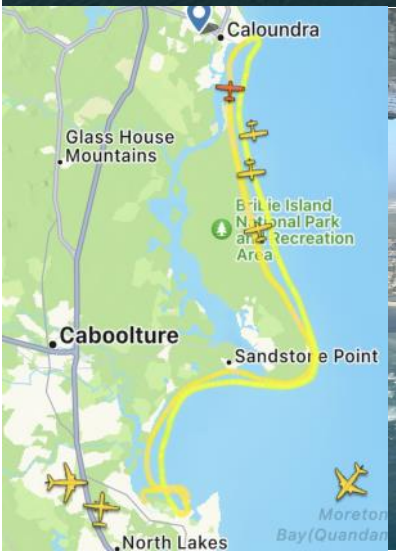
So what does WOTLOPSOP mean? Wide Open Throttle, Lean Of Peak, Standard Operating Procedure. This acronym is the mantra for APS. They insist that on modern day engines there's no need to throttle back after take off, and although you should operate ROP for best power in the climb, you can operate LOP in the cruise to maximise engine and fuel efficiency and keep the engine clean. They suggest these directives be added to operating manuals as standard operating procedures.

This article contains information taught in the APS seminar. It may not reflect the opinions of the Redcliffe Aero Club. You should always discuss such matters with your instructor and read the relevant POH before you fly.

Anzac Day 2023



Our annual Anzac Day dawn service was well attended. Due to inclement weather around first light we delayed the flight until after breakfast. Then the skies cleared and the reward for our patience, apart from full stomachs, was a beautiful smooth flight. Seven aircraft flew in company along the coast to Moffat Head at 1000ft and back at 1500ft. Thanks to Sam Keenan, Bryan Galvin and Phil (Curly) Ware for organizing a great morning.

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