BRISBANE VALLEY FLYER

June 2025

BRISBANE VALLEY SPORT AVIATION CLUB INC

Watts Bridge Memorial Airfield, Cressbrook-Caboonbah Road, Toogoolawah, Q'ld 4313.

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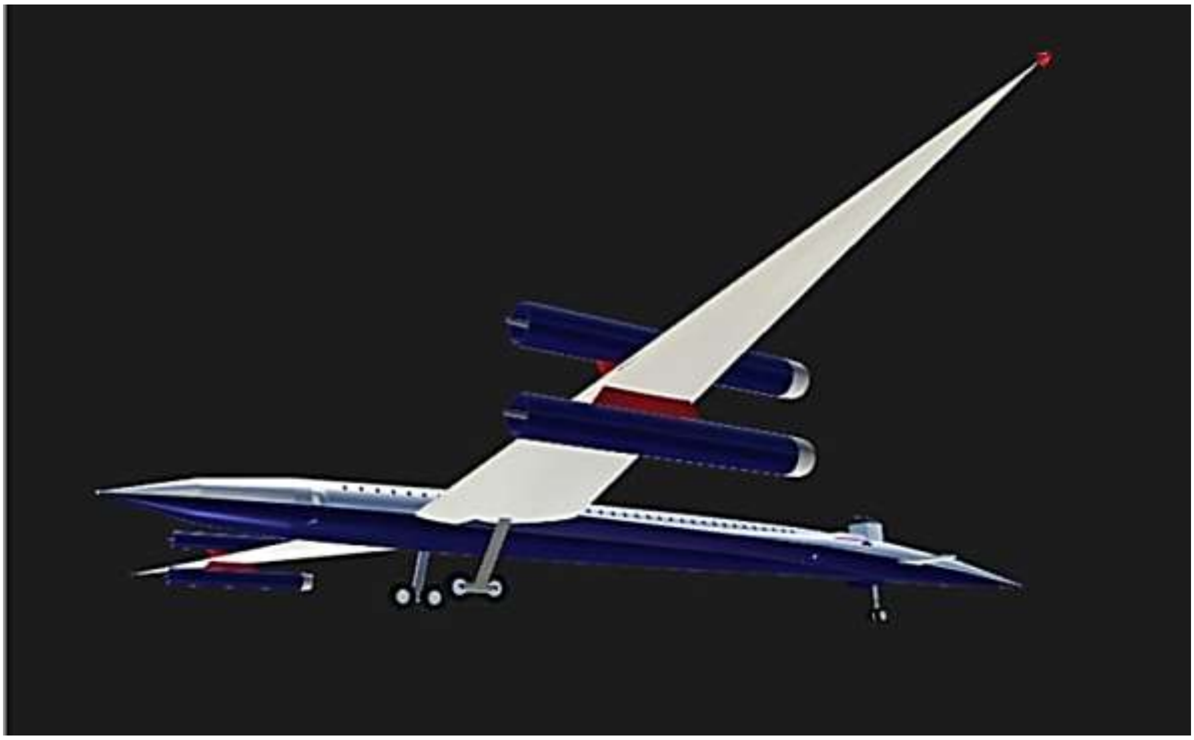

The Vicker 010 Swallow – Barnes Wallace's dream that never came true. See page 10

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Our website - **bvsac.com.au**

Greetings Members,

Last Saturday, 17 May, we took a group trip to the Caloundra Air Museum. It was a great day out with a solid turnout—17 of us in total!

Everyone had a fantastic time exploring the museum. We were lucky enough to access areas and hear stories about the aircraft that aren't usually open to the general public. A real treat for all aviation enthusiasts!

After the tour, we made our way to the Caloundra RSL for a group lunch. The food was excellent, but the company and camaraderie made the afternoon even better. There will be a feature in the next Flyer (for July) on our trip.

Our next meeting is scheduled for 7 June. Everyone is welcome to join us for what promises to be another enjoyable day—topped off with a barbecue lunch.

Looking forward to seeing you there.

Best wishes

Peter Ratcliffe
President BVSAC

A Rusty Pilot Practice Plan

By Rob Knight

The following is a short-but-sweet batch of manoeuvres that any pilot can use to brush up on their skills between those looming flight reviews.

It's easy to shake off any accumulated rust with this pilot practice plan.

So, your logbook's dusty, and your pilot's ticket is rusty, and you see that you have only a few months to run to your next BFR. You may still be current, and within the required recent experience requirements, but you haven't been flying much lately. Your think back – when did I last do some serious flying? A month? Two months? Last spring? A year ago?

Successfully passing a BFR doesn't exactly make you a sharp pilot, it merely means that you been able to demonstrate to an examiner the minimum flying and knowledge standards required to continue holding your ticket. A couple of logbook entries listing training and assessment every second year may satisfy the regulations, but between BFRs you must satisfy your own standards of excellence. After all, you can't expect to be sloppy and still have a CFI sign you off on a flight review: it's his reputation that's on the line. Would it not be better, rather than to accept a deteriorated state, to take some personal steps to sharpen your skills to a finer edge when you go back into the air after a layoff?

As stated, ad nauseum, flying an aircraft is like riding a bike; we never really forget how it's done, but we can certainly get out of practice. We might be wobbly when we first pedal off down the road, but after two or three practices, we can play, "Look Mum, no hands", as much as we like, just like the old days. Nonetheless, we're still going to feel distinctly unrefined until the rust is gone.

As a human, it's is not that your brain has forgotten how to fly but your hands have. As a tangible endeavour, manipulating the controls to achieve precision in flight requires practice; the more recent the better. Being too proud to seek out assistance to rebuild your skills is unwise to say the least.

Everyone says that they know their own aeroplane, or the one they most regularly hire, fairly well. But familiarity with anything is the path to bad habits, and even with experienced pilots, bad habits can be hard to spot. So, before the BFR date, taking a trusted instructor or CFI to watch while you go through your rusty renewal manoeuvres will certainly accelerate you to improved performance and the reacquisition of any lacking basic skills to help when you do the BFR itself. But what happens for the two years following your successful BFR?

On a regular basis, after the BFR, go flying by yourself and run through the exercises you covered in the BFR. You'll get much more productive skill-building done when flying on your own and without the divided attention that is unavoidable with a shared cockpit. If you do want a buddy along, make sure they remain silent at critical moments during the flight. Also, take a sick bag or two, and be prepared to beat a hasty retreat. Better brief your buddy to give you plenty of warning.

Dedication to maintaining the standards is the key to retaining piloting skills. A good pilot that stops striving to retain the skills of a good pilot soon stops being one. My logbooks, filled with the BFRs I have carried out as an examiner speak volumes of good pilots at the time of their flight test, becoming too sloppy for comfort years later because they have become lazy over time. Too lazy to trim properly; too lazy to have a good lookout for aircraft on approach before lining up to take-off; too lazy to have a good lookout before entering a turn: the list is long but once a pilot starts down that slippery slope, it takes a serious effort to stop the rot and retrace the steps to proficiency again. Let's look at the process.

AIRMANSHIP

This is a very broad topic, indeed. The examiner is entitled to query your knowledge of theory including map legend symbols, and flight planning terminology as well as the calculation of drift, compass variation and the calculation of drift/wind correction angles, 1 in 60 rule calcs, fuel, and flight time calculations. Revision in this respect is easy and cost-free, but necessary. The examiner can also ask questions on weather forecasts and reports, such as validity times and the meanings of abbreviations. Also questions in regard to pilot-in-command duties and licence/certificate periods of validity. Ditto the VFRG and the rules and operating requirements it contains. These are easy to revise and cost nothing to revisit. In the interests of safety and proficiency, these should be kept up to date by pilots, anyway, as a matter of course, and as an investment towards their own longevity.

STRAIGHT AND LEVEL.

In flight, a pilot revising their skills could look first at the Straight and Level exercise, generally when levelling off from a climb. The first skill to practice is to use gentle forward pressure on the stick/yoke to have the nose reach the level flight attitude simultaneously with the aeroplane reaching the desired level flight altitude. In most light aeroplanes this forward stick pressure will be noticeable because climb power is still applied and the airspeed has changed (it's accelerating) so the aeroplane is out of trim. After holding the nose attitude and checking that altitude is, indeed, being maintained, and after checking the airspeed is at least half way between the climb speed and the anticipated level flight speed, ease the throttle back to reduce the RPM to the desired cruise power setting. Only when the aeroplane is level, AND has attained the cruise speed should the trim be adjusted to hold the nose in that level flight attitude when all hand pressure on the stick/yoke is released.

From the Examiner (attitude and power):

In my experience, this exercise, the first of the upper-air series, has stuffed up more BFR candidates than are countable. The most common fault is that the pilot tries to complete the levelling out process too quickly. They miss the required altitude (usually the nose is too high) and, whilst still fighting to get the altitude and the nose attitude sorted, draw the power back to cruise. The aeroplane has not reached its cruise speed and is now running on reduced power at below the cruise speed and trimmed? Rubbish – it's not going anywhere, – it's just wallowing around, very imprecise to fly, and doomed to get poor scoring on the examiner's flight test sheet. A pilot, taking the time to achieve each step accurately (attitude, then power, then, when speed rises, trim) will have a far easier road to impressing the examiner.

It might be hard to believe, but to maintain continuing straight and level flight is also a stumbling block for many out-of-practice pilots. There are three principal reasons for their difficulties –

1. Forgetting to continue to keep a lookout for other aircraft, and/or
2. Misusing the controls when keeping the nose on the reference point on the horizon, and/or
3. Forgetting to select a reference point in the first place.

The lookout is mere practice and anyone that fails this item needs a swift boot up the jungle. However, the others are more subtle. Most people imagine that all turbulence is vertical when airborne. They see a sudden roll from turbulence as one wing being lifted by a vertical current. But very often it's not – that sudden roll is the result (further effect) of unchecked yaw caused by a horizontal gust of wind weathercocking the aeroplane, making it yaw about its normal axis. But many pilots fail to notice the yaw that caused the roll. Their brains are pre-wired to have a completely inappropriate priority of movement dangers. Although this should be trained out of student pilots by their instructors, with the passage of time, pilots tend to revert to their original toddler training and they fail to see yaw because they accept it as safe, whilst roll is far more dangerous. Their brains, prioritising roll, see it but their brains ignore the yaw that caused the roll. So they apply aileron to fix the roll and level the wings instead of stopping the yaw with a stomping boot on the rudder pedal to prevent the nose escaping from that selected reference point.

A skilled pilot will see the yaw that caused the roll, and will use rudder alone to pull the nose back to the reference point. This is not turning with rudder, but, instead, doing as the instructor always said – it's keeping straight with the rudder - if the nose moves away from the point – rudder it back into its required position. With attention and practice, the nose won't sideways move much at all whilst the pilot's feet dance to the tune of the turbulence.

This brings to light another trap for the unpractised BFR candidate: keeping straight with changes in airspeed. Aeroplanes are set up so they fly straight at cruise speed and power, but at any other time, rudder may be necessary to keep the ball in the middle and stop flying with slip or skid. This is why rudder is usually necessary to keep the ball in the middle in the climb, and the cause of yaw when the pilot closes the throttle to enter a descent/glide.

From the Examiner (yaw control):

It's hard for an examiner, even one wanting to do the right thing by the pilot on his/her BFR, to let this one go. Surely the ability to fly a straight line is one of the most important skills a pilot MUST have. A pilot that can't fly straight has major troubles with cross-country flights and will be more prone to navigational issues. This is a simple exercise that I have failed BFR candidates on. If you can't keep straight, you aren't safe – it's fundamental, surely?

The process to avoid this problem is simple – go and fly in a straight line. Using rudder only, keep the aeroplane's nose on a selected reference point. Practice this - flying in a straight line with the rudder alone – no aileron. Be gentle, but quick, and stop any yaw and the aileron won't be needed.

Also, whilst practicing flying straight, from cruise, close the throttle and keep straight (nose on the reference point). Don't allow the nose to yaw as the airspeed changes. This should be automatic and done without thinking by any competent and practiced pilot.

TURNING.

Before entering ANY turn, a pilot must ensure that he will not be in conflict with other aircraft. A thorough lookout is absolutely essential before any turn is commenced AND must be maintained during the turn. A failure to carry out an adequate lookout before, or in, the turn, may constitute a failure to get a sign-off on your BFR.

When turning, pilots need to maintain either, height in a level turn, or the correct airspeed in climbing or descending/gliding turns. To achieve this, the first priority is to maintain a constant angle of bank. If the bank angle changes during the turn, it's almost impossible to maintain either the desired height or airspeed respectively. As most aeroplanes exhibit a tendency to over bank, i.e., the angle of bank will naturally steepen during the turn, as explained previously in the Flyer, Issue 62, September 2018, this is caused by the difference in airspeed between the tip area of the inner wing and the tip area of the outer wing, caused by the differing arcs these areas are forced to travel. As the inner wing will travel the shorter arc, and vice-versa for the outer wing, roll into the turn will occur – the aeroplane will tend to over bank and the bank angle will naturally steepen. This tendency is controlled by out of turn aileron applied sufficiently to stop the bank angle increasing.

The second, and the most recognised issue with turns, is maintaining balance during the entry to, and the exit from, the turn. The word balance in this case refers to balancing, with rudder, the adverse yaw created by aileron drag. As the drag is aileron induced, it will occur with every application of aileron. So, as we use aileron to roll into the banked attitude to turn, we will require rudder as we apply the aileron. Also, as we use aileron to roll out of the turn, we'll need rudder to balance that aileron drag as we exit the turn. If we move the stick to the left to roll into a left turn, we'll need left rudder to balance the adverse right yaw we'll encounter. And vice versa as we exit the turn. To regain a lost skill, try rolling left and right with the nose on a point on the horizon, ensuring the nose stays on the point with rudder. Use the controls gently and it will become easy to see how much rudder you will need to balance each roll rate. Remember, the faster the roll rate the more aileron that must be used and, with more aileron deflection, so will more adverse yaw be created.. Get some practice and you'll surprise yourself how quickly you get to keep that ball in the middle.

From the Examiner (turning):

To enter a turn (to around 30° bank) the process is simple.

1. *LOOKOUT, all around the aeroplane, above, at the same level, and below, insofar as you are able.*
2. *Note the current reference point and roll in with aileron whilst balancing with rudder.*
3. *STOP THE BANK (at the 30°) by centralising the aileron, simultaneously centralizing the rudder.*
4. *Check bank angle is constant (keep constant by holding a little out of bank aileron along with rudder to balance the adverse yaw).*
5. *Check ball centred. (if not – step on the ball).*
6. *Check height constant OR airspeed constant in climbing/descending turns).*
7. *Re-affirm LOOKOUT.*
8. *Repeat from item 4 above until ready to exit the turn.*

To return to straight (wings level) flight:

1. *LOOKOUT, all around the aeroplane, above, at the same level, and below insofar as you are able.*
2. *Roll OUT with aileron whilst balancing with rudder.*
3. *STOP THE ROLL when the wings are level (centralise stick and rudder).*
4. *Check, height/airspeed being maintained.*
5. *Check ball centred.*
6. *Check/select next reference point on the horizon to fly towards.*
7. *LOOKOUT.*

Remember, you are trying to acquire finesse in your flying, not just experience the exhilaration of banking and yanking.

For sign-off purposes, the examiner will be considering your lookout before entering and during the turn, and before the exit. He/she will also be watching your balance co-ordination (ball in/close to the middle) throughout the entry, the turn, and the exit from the turn, as well as height/airspeed control

STALLING

Unfortunately, and alarmingly, too many pilots are overly concerned about stalling. They believe that the exercise contains hidden, inherent dangers that give risk to one's very imminent survival. I completely understand because I can still vividly recall having my shirt stick to my ribs when the instructor checking me out for a C172 rating in 1965 said, "Now I want to see a real wing-drop, not that piss-arsed thing you just gave me". At that time my opinion of stalling was mostly formed by dastardly near-fatal stories in the bar at the Aero Club. My avid listening to these tall tales served me no good purpose. I now look back 57 years and see that these barflies were better drinkers than pilots, and knew less about stalling than I did! Even then.

For the BFR, Initially, we are looking at basic stalls, with slow deceleration, in straight and level flight, aiming the aeroplane at a selected reference point. Post HASEL checks, the power is reduced at cruise speed and configuration, while level height is maintained by easing the stick back as the airspeed decays and, at this unstalled stage, the wings are levelled with aileron. As the airspeed decays with the power OFF, the lift reduces and, to prevent the aeroplane sinking as the lift reduces, the stick is drawn back just sufficiently to increase the angle of attack to maintain height. When the angle of attack exceeds the critical angle (the stalling angle of attack), the stall occurs.

Note that, as the airspeed diminishes after the power is reduced AND before the stall occurs, two things are likely to occur.

1. The nose will naturally yaw and this yaw must be noticed and corrected by the pilot using rudder.
2. AND, as the airspeed falls, so will the trim change causing the stick or yoke pressures to change. **DO NOT RE-TRIM**

The pilot must be able to control the aeroplane about its three axes during the approach to the stall to be deemed proficient for a BFR sign-off. A hidden aspect of this exercise is that, during this process, the examiner is watching a demonstration of your ability to control the aeroplane in yaw, pitch, and roll whilst the airspeed is changing.

The symptoms of the approaching stall are several. As the airspeed decays there is a decrease in noise (although expensive headsets can negate this), the airspeed indicator needle retreats to lower indications, and the controls become noticeably lighter and less responsive. If the aircraft is fitted with an audible or visual stall warning, it should sound, or light up at this time.

A buffet will begin, its magnitude determined by the aeroplane type and its rigging. The buffet will tend to deepen and, as the stall breaks, the nose will sag down and the aeroplane may or may not roll a little. The nose sag is caused by the centre of pressure moving aft along the chord line at the break-away of the streamlined flow over the wing with the stall so it’s a sure indicator that the stall has occurred. As this is a simple stall, with no power or flap applied, there should be very little tendency for a wing to drop markedly and the aircraft to roll subsequently. But the aeroplane will begin to sink quickly.

To recover:

1. Stick forward (just sufficient to reduce the angle of attack to below the critical angle), and, at the same time,
2. STOP any yaw with rudder (don’t let it yaw any further from the selected reference point), and
3. Apply full power to minimise the height loss using further rudder as necessary to keep straight as the application of power will also cause nose swing (just as it did on take-off).

HINT: Don’t worry about wings level until after the recovery, and, even then, use aileron judiciously to prevent a subsequent secondary stall. Over-use of the aileron on the wing that you are trying to pick up may cause an even more savage wing drop and a control reversal. If the wing that you are trying to lift stalls yet again, the stall will be deeper and the aircraft response will be more savage and this increases the roll rate and the yaw towards it. DON’T USE AILERON until after the angle of attack has been reduced

When loaded correctly (with its Centre of Gravity within its limits), light aeroplanes that are correctly rigged are easily recoverable from a simple stall with an altitude loss generally of 200 feet or less. Of course, panicked and/or mis-used controls can magnify this many times over which is why wise pilots only carry out stalling exercises at a safe altitude.

When feeling up to it, the second stall type may be practiced. This is the power-on stall, the same basic stall except leaving some power applied (perhaps up to 3000 RPM for Rotax 4 strokes, or 1500 RPM for fixed pitch Continentals or Lycomings).

Entry to the stall is via the same process, as will be the recovery. Note that, with the added power, deceleration will be slower and you will notice it takes longer from the time of set-up to achieve the nose sag at the stall. Also, the nose will most likely be higher at the point of the nose sag.

Try some and when you're comfortable with these, try a stall without power but using some flap. In this case the deceleration will be quicker so there will be likely less time from the set-up to the stall nose sag.

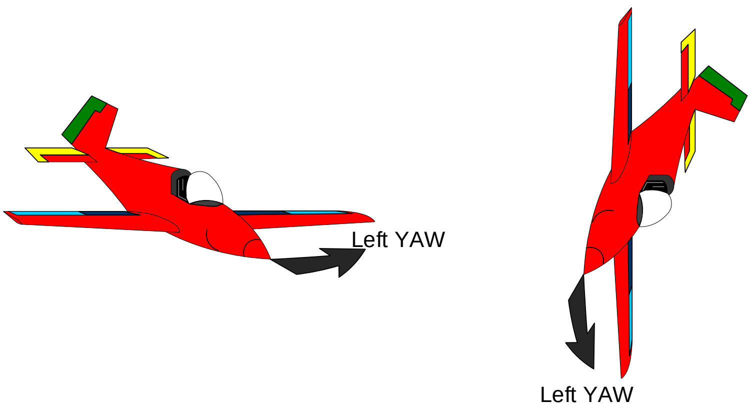
Then try a combination, a stall with both power and flap. Not full power and not full flap, just a bit of each. There should be no surprises in this, either.

Lastly, and the pinnacle of the stalling exercises, is the fully developed stall with a wing drop. Nowadays this is a bit of a misnomer because many light aeroplanes refuse to drop a wing in a stall unless they are deliberately mishandled. If the aeroplane that you are flying is reluctant to drop a wing in a fully developed stall, you should consider seeking assistance from an instructor rather than try to induce a wing drop stall yourself. Also, if you lack experience relating to this type of stall specifically, from a danger point of view (best practice policy), assistance will give peace of mind as well.

A wing drop stall is simply a stall where one wing stalls before the other. At, and after, the critical angle is exceeded two very important attributes of any wing are deeply affected.

1. The lift provided by that wing diminishes very dramatically, and
2. The drag on that wing rises exponentially.

So, when both wings stall at, or very close to, the same time, the lift reduction affects both wings by a similar amount (and the aeroplane remains pretty much wings-level), and the drag increase is also even on both sides of the aeroplane and there is no great tendency for the nose to yaw or wing to drop. When only one wing stalls, that wing has a savage loss of lift (inducing roll towards that wing) and the monstrous increase in drag yanks the nose sideways. However, because the aircraft has rolled (or is rolling) that yaw, about the normal axis, wrenches the nose below the horizon. Herein lies the autorotation and the incipient spin. It's all caused by one wing being more stalled than the other.



As discussed above, the stalled wing will drop and the aeroplane will roll towards that stalled wing while the nose will also yaw towards that wing. These two actions were not initiated by the pilot and therein lies primary cause of the disquiet that many low-time pilots have of stalling – the fact that the aircraft may begin a motion not instigated or controlled by them. To them, this is frightening as they perceive this to mean that the aircraft is out of control. Of course, it is not. It's no more out of control than squealing the tyres when taking off from an intersection in a car. Its cause is not a mystery, its danger level is zero, its recovery is easy, and quick, and only requires a modicum of presence of mind, namely, "break the stall on the stalled wing and stop any yaw with rudder". In other words, stick/yoke forward (just enough) and push the rudder pedal on the up-wing side just enough to stop any yaw. Bring in full power to minimise height loss and it's all over. There is no issue, no danger, nothing to fear except fear itself. Mind you, I have remonstrated with instructors with whom I have been doing instructor renewals when they have pattered that they are "regaining control" as they recover from the stall. This is absolutely false as control was never lost in the first place. All the wing drop stall has done is to set the aeroplane up so an unusual aeroplane response comes from control inputs. If there is a critical action in stall recovery in modern aeroplanes, it's to prioritize the unstalling of the wing BEFORE aileron is used to level the wings. Who cares if the aircraft has rolled 50°? Time is plentiful, there's no hurry, really, to level the wings. After all, you should have 3000 feet plus beneath you.

Hint: Set in your mind that:

1. We get the stick forward just enough to unstall.
2. We apply just enough rudder to STOP any yaw towards the down-going wing.
3. We add full power to minimise height loss in the recovery process
4. We ease out of any dive with gentle back stick lest we re-exceed the stalling angle

With practice, the first three steps can be carried out virtually simultaneously, only leaving the dive recovery to complete to return to level, unstalled flight.

An examiner carrying out a BFR can also ask you to demonstrate a stall in a turn. Again, this is a simple exercise and not to be feared.

For a stall in a level turn, just roll into the turn at cruise power and speed, and allow the bank angle to increase whilst maintain height. The usual expected recovery is to unstall as above (stick/yoke forward to reduce the angle of attack on the wings, rudder stop any yaw and finishing by abandoning the turn and rolling out to level flight. If such an examiner was to ask to remain in the turn, just ensure that, after the recovery you continue the turn with normal power for cruise and about 45° of bank applied. Variations in this exercise are to stall and recover in a climbing turn, or stall and recover in a gliding (or descending) turn. If asked to demonstrate one of these, check for exactly what the examiner is requiring.

FORCED LANDING EXERCISE

There are several ways this exercise can be asked for by the BFR examiner. It can be carried out on your return to your departure airfield, or somewhere away from there, into an area not normally used for aircraft landings. Usually, the examiner will set up a complete engine failure, so a glide approach into the selected field along with the appropriate checks and drills pertaining to this exercise will be required. However, they could also set up a partial failure to check on how you would handle the extra decisions such an event would necessitate.

For the usual version, into a selected non-airfield, here are some hints.

The aeroplane must be flown within 5 knots of the correct airspeed at all times.

The aircraft must be trimmed.

Carburettor heat must be applied (where fitted).

Lookout must be maintained at all times – during a straight glide as well as before and during turns.

Engine warming every 500 feet must be maintained.

Aim to land with full flap (where flap is fitted), 1/3 into the selected field (in a real one, it would be better to go through the far fence at taxi speed than the near fence at flying speed).

RETURNING TO BASE

The return to base (when the forced landing has been carried out elsewhere) is the opportunity for the examiner to review your circuit joining procedures and, in particular, your circuit leg entry and radio usage. The usual downwind checks must not be forgotten, and all approach airspeeds and procedures such as carburettor heat OFF on short finals be carried out. You may be required to demonstrate a cross-wind landing/take-off, and a short landing using full flap, if the wind conditions allow. In a taildragger, you can expect to be asked to demonstrate a wheeler landing as well as a three-pointer.

If you haven't flown for a significant amount of time, you might feel more comfortable taking an instructor with you, or at least invite an experienced current-in-type pilot to ride along to offer critiques while you practice. But then, ensure that you put in some solo time. Be hard on yourself, but remember that the examiner is not looking for perfection, merely a good, workmanlike demonstration of your ability to carry out the prescribed exercises in the prescribed manner.

Just like it is with bicycling, the ability will still be there, it's just hidden under layers of rust. All you need is to take up the challenge and refresh your skills to regain your past levels of expertise. Don't fear a BFR. Instead, revel in the opportunity to revise and, perhaps even, learn something new.

Happy flying

Barnes Wallis and the Vickers 010 Swallow of the 1950s

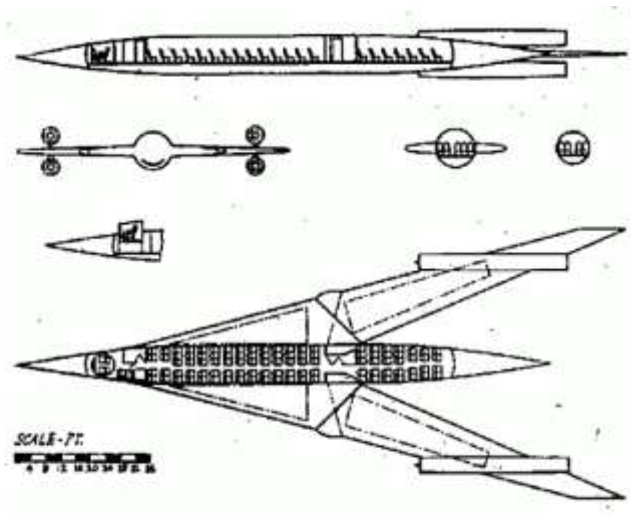
By Rob Knight

The Vickers Type 010 Swallow. Note the engine mounting location and design.

Post World War II, military powers were left in no doubt that, to reduce the chance of a repetition of such a war, ongoing research in more advanced aircraft designs was mandatory. Also, it would necessitate building on the aerodynamic advances seen during the conflict and those advances were dramatic. However, not all ideas and concepts proved viable, and, in some advances, the concepts had to be discarded as, at least in those times with the then existing materials and expertise, design concepts could, and did, outstrip available technology and resources. The Vicker Swallow was one such concept.

Based upon knowledge acquired during the conflict, engineer and renowned British inventor, Barnes Wallis famous for his dam-busters bomb design, and now long-term employee of the aircraft company Vickers-Armstrong, took a special interest in the field of variable-sweep wings, and the potentials of various advanced wing designs. During this period, Wallis conceived the concept of an aircraft which would function normally, but without a vertical tail fin/rudder. Instead, it would utilise variable geometry wings as its primary means of flight control. He interested his line of thought within the British government and the Ministry of Defence arranged for a series of tests to demonstrate and research his concepts, both for projectiles, and a potential form of anti-aircraft defence.; In conjunction with these diverse aims, Wallis continued to promote the concept of a manned variable geometry aircraft.

Wallis's fertile mind aided by research produced a new aircraft design – the Vickers Swallow. It was a relatively larger than the usual long distance capable aircraft of the era, it was unique in that it used a moveable delta wing configuration for roll and directional control. While initially envisioned as a multi-role concept aircraft, the full-scale Swallow was initially viewed as a possible very long-distance airliner; with the drag and weight reductions from its tail-less design, it was to be vastly more fuel efficient than current aircraft designs and projections of its range would have enabled a non-stop UK-Australia route to be operated. However, over time, its appeal moved to favour its development into being a potential

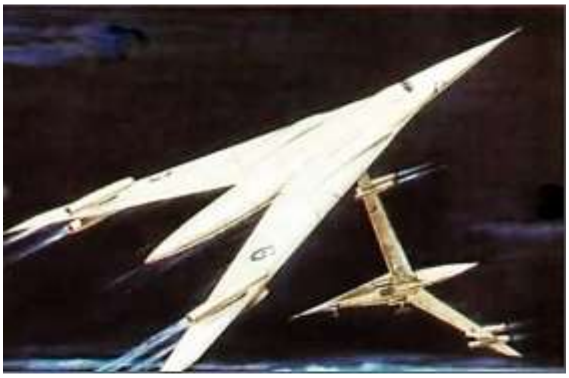


Sketches of the 010 Swallow concept.

supersonic successor to the subsonic Vickers Valiant, one of the RAF's V bombers. In 1951, the Ministry of Supply issued specifications calling for the development and possible manufacturing contracts for various such research aircraft.

By the summer of 1956, a series of flying models had been constructed and flown. The data gathered from flight tests had reportedly resolved all of the Swallow's technical problems but, by this time, government interest was fading in light of other commitments while the Vickers Aircraft Company was not in a financial position to independently fund the Swallow's development through to a full-size aircraft. In June 1957, Air Ministry funding for the venture ceased and formal work on the project was ended.

Despite the termination, Swallow continued to attract attention internationally. During late 1958, research efforts were temporarily revived through cooperation with the Mutual Weapons Development Programme, a project belonging to NATO, under which all of Wallis' variable geometry research was shared with the Americans. While numerous American aerospace engineers at NASA were enthusiastic in regard to the concept, the United States Department of Defense was opposed to committing any resources to the project.



An artist 's impression of the 010 with unswung and swung wings, allowing a potential cruise speed of Mach 2.5

Research into Swallow produced several new configurations aimed at improving aspects of its performance, some involved the adoption of a compact folding tail section, canards, an expanded fuselage, and repositioned engines being examples of the various directions in which the research developed. While the concept drew the attention of the United States Navy, competing programmes, such as the supersonic transport (SST), led to no commitments ever being made, thus Swallow concept did not advance further.

Note: Barnes Neville Wallis genius began to surface when he worked for the Vickers Aircraft Company on the team designing and developing the R100, England's most successful airship. A major aspect of the R100 design was Wallis's geodetic construction which used light alloys to provide an airframe strong enough to hold the massive gas bags. However, after numerous successful and safe intercontinental flight without incident, the R100 was withdrawn from service and destroyed after the R101 Airship crashed with a great loss of life in France in October 1930.

The Vickers-built, R100 airship. The most efficient airship ever produced.

Wallis further used the geodetic method of airframe construction in the manufacture of the Vicker Wellington bomber during WWII. Whilst not without some drawbacks, it was nevertheless very robust and the Wellington bomber was recognised as being able to take a great deal of punishment from the enemy and still make it home to England in tatters.

One of his greatest successes was the design and development of the “skipping bombs” used to attack and seriously damage the Möhne, Eder and Sorpe dams in the Ruhr area during 1943. His bomb designs developed further and resulted in the production of the first the Tallboy bomb (6 tonnes) and then the Grand Slam (10 tonnes) deep-penetration earthquake bombs. Note that these were not the same as the 5-tonne "blockbuster" bomb, which was a conventional blast type bomb.

Although the allied forces still had no aircraft capable of carrying these Tallboy and Grand Slam bombs to their design altitudes, they could be dropped from lower-heights and still strike the earth at supersonic speed to penetrate to a depth of 20 metres before exploding. They were used on strategic German targets such as V-2 rocket launch sites, the V-3 supergun bunker, submarine pens and other reinforced structures, large civil constructions including viaducts and bridges, as well as the German battleship *Tirpitz*. These two bombs were the forerunners of modern bunker-busting bombs as saw service beginning in the Korean war. It is believed that BLU-109 bunker buster bombs were used in the strikes that killed Hezbollah leader Hassan Nasrallah in Beirut on 27 September 2024.

A General Dynamics F.111 Aardvark in 1964.

After WWII Wallis was part of the team of designers whose expertise and research were encouraged and harvested by NASA, and ultimately became part of the data developed into the General Dynamics F.111 Aardvark, as operated by the USAF and the RAAF.

Wallis died in England in 1979, aged 92.

------ ooOOoo ------

A woman was visiting a blonde friend who had just acquired two new large dogs. When she asked their names, the blonde said, Rollex and Timex”.
Strange names for dogs the woman replied. To which the blonde replied, Why so, they’re both expensive watch dogs”!

Sunnies and The Aviator - Accessories or Necessities?

By Rob Knight **M23-123**

Do sunglasses have a place in the cockpit? Are sunglasses a mere accoutrement to elevate the social status of a wannabe pilot, or do they really have a role to play in aviation safety?

Aircraft pilots have always retained a certain status in the eyes of the general public, or so is generally imagined. The results of this tends towards a perception that all pilots are barnstorming types, that have superhuman nerves and brilliant skills in mathematics and all sciences. This perception is retained by all except the pilots themselves, and is particularly galling when an instructor is fronted by a trainee that is convinced of this myth. Not only have I experienced it, but even back in the 1930s Ernest K. Gann reported it in his book, "Fate is the Hunter". He depicted as a hoary axiom of flying that young neophytes were possessed of three things in lieu of actual flight experience – large ornamental wings, a large and complicated wrist watch, and a penis to match the assembly. Little has changed over the intervening near century, except that the wearing of the largest and darkest sunglasses has been added to the ensemble.

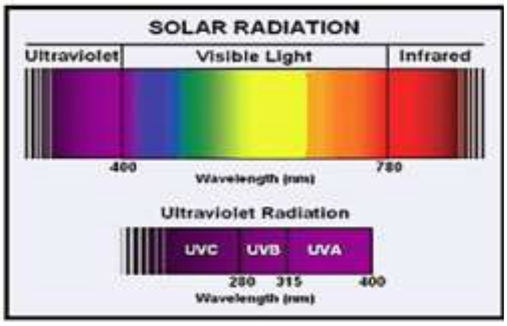
The question of sunglasses in aviation, or otherwise is easily answered. And the answer is a resounding YES!

No protection

With good protection

Quality sunglasses provide protection from dangerous light frequencies to a pilot's most important sensory asset – vision. An appropriate pair of sunglasses can be an essential commodity in the cockpit environment to heighten a pilot's visual performance. Sunglasses reduce the degenerative effects of harsh sunlight, reduce eye fatigue, and guard ocular tissues against exposure to harmful solar radiation. Additionally, they can provide physical protection for the pilot's eyes from impact with objects (i.e., debris from a bird strike, or objects from pockets or loose in the cockpit when engaged in aerobatic manoeuvres). Lastly, sunglasses can also minimise the time necessary for the dark adaptation process[1], which is delayed by prolonged exposure to bright sunlight.

Concerningly, the sun's radiation can damage human and eyes when exposure is either excessive or intense. Fortunately, the Earth's atmosphere provides shelter from the more hazardous solar radiation (i.e., gamma and X-ray); however, both infrared (IR) and ultraviolet (UV) radiation are present in our atmosphere in varying amounts, their variations being dependent on factors such as the time of day and season, latitude, altitude, weather conditions, and the reflectivity of surrounding surfaces. For example, exposure to UV radiation increases by approximately 5 percent for every 1,000 feet of altitude, and when exposed to snow surfaces of clouds.



Electromagnetic radiation spectrum including visible, infrared, UVA, UVB, and UVC wavelengths.

Atmospheric IR energy consists of longwave radiation (780 – 1400 nanometers [nm]). IR provides the warmth felt from the sun and is considered to be harmless to

[1] The process by which the retina adapts to decreasing levels of illumination.

the skin and eyes at normal atmospheric exposure levels. Thought to be more hazardous to human tissues is short-wavelength UV radiation. UV is divided into three bandwidths: UVA (400 – 315 nm), UVB (315 – 280 nm), and UVC (< 280 nm).1 Excessive or long-term exposure to UVA and, to a greater extent, UVB causes sunburn, skin cancers, and is implicated in the development of cataracts, macular degeneration, and other eye malaises. For these reasons, learned bodies recommend using sunglasses that incorporate 99 – 100% UVA and UVB protection. Luckily, UVC, the most harmful form of UV radiation, is absorbed by the atmosphere's ozone layer as it passes through it, and herein lies the concern by some scientists - that depletion of the ozone layer may allow more UV to pass through and become a serious eye-health hazard to all vision-using life on earth.

The three most common lens materials used in sunglasses manufacture are:

1. Optical quality "crown" glass,
2. Monomer plastic, and
3. Polycarbonate plastic.

Lenses made from crown glass provide excellent optical values. Crown glass is also more scratch resistant than alternatives, but heavier and less impact resistant. Glass naturally also absorbs some UV light but absorption can be upgraded either by additives during the manufacturing process, or by applying a special coating. Glass retains applied tints best over time, but for higher refractive correction, the colour may be less uniform, as parts of the lens will be thicker than others.

Monomer plastic lenses also possess excellent optical qualities, they are lighter in weight and more impact resistant than glass lenses, but are scratched, even when scratch-resistant coatings (SRC) are applied. Lenses of this material tint easily and uniformly, even for those requiring substantial refractive correction, but do not hold tints as well as glass. However, if fading creates issues, monomer plastic can be bleached and retinted at any time.

Polycarbonate plastic lenses are even lighter than monomers and the most impact-resistant lenses available. Lenses of this materiel suffer few inherent optical aberrations. Applying anti-reflective (AR) coatings will improve optical quality, particularly when a high refractive correction is prescribed. These lenses have built-in UV protection and are manufactured with a scratch-resistant coating that is much stronger than that applied to monomer type lenses. Since polycarbonate lenses do not accept dye as readily as Monomer plastic, they are less adaptable for use as sunglasses. However, as the interior anti-scratch coating will absorb tints, within limits they are still useful in this field.

The spectrum of tints available for sunglasses is almost infinite and the three most common tint colours are grey, grey-green, and brown. While any of which would make an excellent choice for the aviator, a grey (neutral density filter) is most recommended because it distorts colour the least. However, some pilots believe that grey-green and brown tints enhance vividness and minimize scattered (blue and violet) light enhancing contrast in hazy conditions.

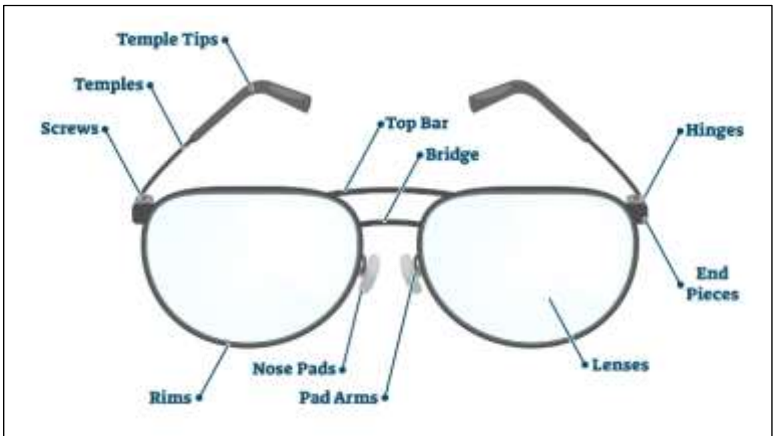
Other tints such as yellow, amber, and orange (aka "Blue Blockers") eliminate short-wavelength light from reaching the pilot's eyes and reportedly sharpen vision, although no scientific studies support this claim. Also, these tints are known to distort colours, making it potentially difficult to distinguish the colour of navigation lights, signals, or color-coded maps and instrument displays.

For flying, sunglass lenses should screen out only 70 - 85% of visible light and not appreciably distort colour. Tints that block more than 85% of visible light are not advised for flying due to the potential to reduce visual acuity and cause difficulty reading instruments and written material inside the cockpit.

Polarized lenses are never recommended for use in the aviation environment. While useful for blocking reflected light from horizontal surfaces such as water or snow, polarization can reduce or eliminate the visibility of instruments that incorporate antiglare filters. Polarized lenses may also interfere with visibility through an aircraft windscreen by enhancing striations in laminated materials and mask the sparkle of light that reflects off shiny surfaces such as another aircraft's wing or windscreen, which can reduce the time a pilot has to react in a "see-and-avoid" traffic situation. See end-note #1.

Glass photochromic lenses, like their plastic counterparts, darken when exposed to bright or intense light, and lighten when exposed to dimmer light. Most of the darkening takes place over the first minute, whilst lightening takes considerably longer – several minutes. This delaying of good vision in a shadowed cockpit can be very hazardous to safe flight.

Although photochromatic lenses can be as dark as sunglasses, warm temperatures (<20°C) can seriously reduce their ability to darken, and reduced UV protection in the cockpit can further limit their use. In addition, the faded state of photochromic glass lenses may not be clear enough to be useful or safe when flying in IMC or at night.



Parts of glasses frames.

The choice of sunglass frames is, within limits, more a matter of personal preference than lens material or tint. The frames of an aviator's sunglasses, however, must be functional and not interfere with the fitting of pilot's headsets. Frame styles that incorporate small lenses are seldom practical since they will allow too much visible light and UV radiation to pass around the edges of the frame.

A sunglass frame should be sturdy enough to take some abuse without breaking, yet light enough to be comfortable. An aviator's sunglasses should fit well so that sudden head movements from turbulence or aerobatic manoeuvres do not displace them. Note that Temples, with thick sections, reduce peripheral vision so should be avoided at all costs. Thick rims will cause blind spots and should also be avoided.

Ray Ban sunglasses, available as plain lenses or on prescription.

Finally, the use of a neck-strap is advised, to prevent prescription sunglasses from being accidentally dislodged, or a necklace chain can be used to allow them to be briefly removed and subsequently replaced.

To summarise, while perhaps adding to the mystique of an aviator, sunglasses will protect a pilot's eyes from glare associated with bright sunlight and the harmful effects from exposure to solar radiation. Lenses for sunglasses that incorporate 100% UV protection are available in glass, plastic, and polycarbonate materials. In regard to constructive materials, glass and monomer plastic lenses have superior optical qualities, but polycarbonate lenses are lighter and more scratch and impact resistant. The choice of tints for use in the aviation environment should be limited to those that optimize visual performance while minimizing colour distortion, such as a neutral grey tint.

Polarized sunglasses are never recommended for aviation related purposes because of their possible interaction with self-polarising curves in cockpit canopies causing blind spots, and with displays or other materials in the cockpit environment. Since sunglasses are an important asset, whether or not refractive correction is required, careful consideration should be used when selecting an appropriate pair for flying.

Finally, the technology associated with ophthalmic lenses is continually evolving, with the introduction of new materials, designs, and manufacturing techniques. Aviators should consult with their eyecare practitioner for the most effective alternatives currently available when choosing a new pair of sunglasses.

Note #1.

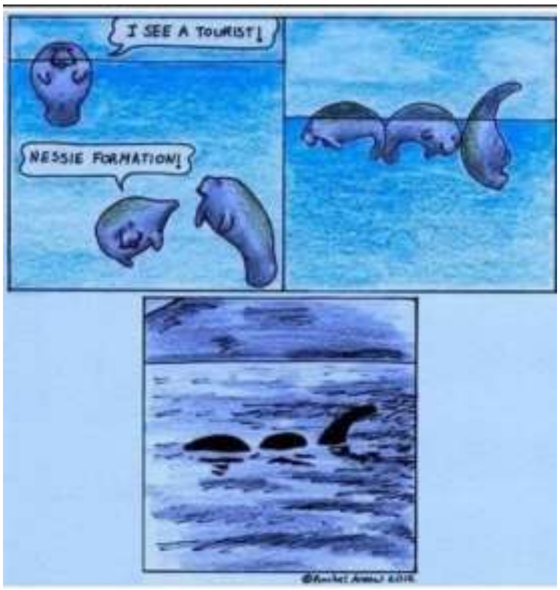
I was first made aware of issues with polarising lenses in sunglasses when I brought a pair with such lenses in the late 1960s. Believing the ravings of the vendor, a local pharmacy in Kaitaia, I paid NZ$6.95 – more than a week's wages at the time, but believed the investment would see me right for years.

At that time, I was a newly qualified PPL and had risen in glory from the two seat PA22 Colt to the 2/4 seat MS880 Moraine Saulnier Ralley (ZK-CGY) which had a vast, multiple-curved Plexiglas cockpit canopy. Shortly after my sunglasses purchase, I took a friend flying and was amazed at the black, purple, and dark grey patches that appeared when I looked out from the cockpit. They followed me around and moved when I moved my head. Stupidly, I still went flying (without event) but mentioned the experience at the club counter when I returned. The duty instructor told me, in very definite and expletive-filled terms, that polarized lenses were forbidden in NDAC Club aircraft because the light passing through the Plexiglas became polarized in itself and thus refused to allow me to see through it.

MS880B, ZK-CGY, and its curved Plexiglas canopy.

Lesson on lenses learned, lesson on bad investments through a lack of knowledge – also learned.

------ ooOOoo ------



Practice Doesn't Always Make Perfect

By Rob Knight

In my opinion as a flying instructor with in excess of 10,000 hours logged sitting in the right seat, and 15 years as a flight examiner, virtually all basic stall training and stalling practice for pilots in the civil environment is done inappropriately.

Now that's a pretty bold statement considering that most of us were taught stalling in a very similar fashion, but within this piece I hope to make you think differently about your training, and how you might practise stalls, and differently about how you view your own thought processes regarding the subject.

How were you taught stalling? I'd bet wildly that you were briefed (to a greater or lesser extent) and that your initial airborne training consisted of a demonstration and a course of several gentle stalls from a slow-deceleration level flight condition. The nose attitude would have been raised to maintain height (to compensate for the lift decay with the diminishing airspeed) and the instructor would have been pattering the identifiers of the approaching stall (the rising nose attitude, decaying airspeed, controls becoming lighter and less effective etc.), the onset of the stall, usually beginning of a buffet felt in the controls and/or airframe), and the developed stall (deeper buffet, uncommanded nose sag, and maybe a tendency to roll and/or yaw). Then your instructor probably yelled,

> "RECOVER", the stick was pushed forward (hopefully only a little bit to unstall),
> "KEEP STRAIGHT" hopefully meaning to stop any yaw),
> "FULL POWER" (to minimise height loss)!

At this point, now with a low nose attitude, the noise increases, the airspeed begins to rise bringing the stick (or yoke) back to life. The nose wants to pitch up on its own (with the low speed and the application of full power giving a nose-up trim change). You take control of the pitch up and hold it at the normal climb attitude, then wait for the altimeter to register that you are back at your entry altitude. You level off. That's a stall, done, dusted, and pushed back into its pigeon-hole! Ho hum.

This general process, is practiced ad-nauseum, and it does cover the entry, onset, stall, and recovery from a stall – BUT Only ONE very specific slow deceleration stall. This exercise is limited to a stall:

- level flight, begun in straight flight with the wings level, ball centred, the carburettor heat on and
- In full mental preparation for a fast, accurate, recovery sequence.

But that is an absolutely flawed scenario for stalling in general. A stall, caused by the breakdown of streamline flow across the upper surface of the wings, can happen at any power setting, any attitude, at any weight, any angle of attack or any other condition of flight – wings level, or banked, nose vertically up, or down. Certainly, lip service is paid to other situations, including stalling in a turn (climbing or descending) but these are seldom practised and are only an exception. Consequently, when someone talks about stalling, it's all about a deliberate or intentional stall, one commencing from level flight, with green airspeed ranges and white arcs on the ASI, and plenty of time to set up the recovery in one's mind. This concept is False, FLAWED, and bloody DANGEROUS!

Although more advanced stalls are taught and practised with power applied, flap, and with wing drops (where possible) the manner in which they are taught and practiced remains the same. When taught and practised in this fashion the training and practise will never be realistic rehearsals for the sneaky stall, the stall that appears from nowhere; that stall that occurs with the nose lower than the horizon, with plenty of airspeed on the clock, and normal or even heavier than normal control loads. When a stall occurs under these not-practised conditions, it's inevitable that there is a wide-open opportunity for pilot to fail to recognise what is really happening, and the time it takes to come to the correct realization, act on it, and then have the aircraft respond in real life can be a fatal issue on its own. Ask the Air France Flight 447 pilots, who, as fully qualified pilots, failed to recognise a stall and subsequently died amongst the 228 killed in the Atlantic in 2009, about confusion. They had about 38,000 feet, and even that wasn't enough.

For too many pilots, excluding instructors of course, , the only time they do a stall is maybe doing a little quick, self-revision before a BFR. They complete their HASEL checks and confirm the area is clear of traffic. They reduce power, slow to V_{FE}, extend flaps, then maintain height by raising the nose attitude. No mention of angle of attack. Soon, while keeping the wings level, things get mushy and then, with the nose way up high, … that sinking feeling arrived. They checked forward to lower the nose, simultaneously pushing the throttle forward to full power. Keeping sort of straight with the rudder, they adopted roughly the climb attitude and climbed back to entry height.

Why am I stating the obvious? Because I want you to see how practicing your stalls in this manner is absolutely flawed in the long term. Sure, this is exactly how stalls are practiced in the main, but practiced in this manner only ensures that a pilot is perfectly conditioned to carry out deliberate, pre-planned stalls. The practise does nothing to maintain any expertise in the recognition of, or recovery from, that unexpected stall - the sneaky one, the one that YOU don't set up. In fact, in this case of stalling, this standard approach to training and on-going practice could conceivably increase your chances of having an accident. Unless YOU learn to feel the stall break when practising stalls, a SURPRISE one will be just that and, at low level, you will have likely have only the briefest time period to identify the buffet/change in feel in the stick with the breakdown in upper wing surface airflow, and then to make an appropriate response before it's too late.

For better results, you need to practice stalls in a wider variety of situations. Some wings level, others banked. or enter a shallow dive at low power and low airspeed, and pull the stick back until the buffer appears, and then remove the buffet by stick forward to reduce the angle of attack. Try stalls in gentle climbs, and climbing turns, whatever condition your imagination can project, but always note the buffet and respond immediately and correctly to that signal your aeroplane is sending to you. That buffet is your aeroplane talking to you. Learn to listen to it. If your aeroplane doesn't buffet (very few), learn to feel the break of the stall and respond to that.

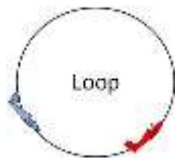
In truth, in my own training, my first reaction to stalling was fatalistic dread. My instructors had developed a self-belief that my competency was doubtful, and that I constantly ran a serious risk of losing control of the aeroplane in the stall because of my poor skills in stall recognition and recovery. My listed failings were stated as being unable to identify the onset of the stall, the inability to apply the correct amount of forward stick to unstall, and failing to apply enough rudder to stop yaw. Most of my issues were caused by the instructors shouting and delivering instructions and criticisms so fast that all I could gather from them was uncensored criticism. They failed to adequately explain the topic and then put me under such intense pressure to perform that I never really knew what they wanted. Their deliberate provocation of fear and incompetence in myself stopped me being able to see what they were instructing me to recognise and do. However, in spite of these apparent failings – I was passed as a PPL.

Fortunately, my feelings have matured a bit since then, thanks to experience giving me a more comprehensive understanding of airflows and exactly what is happening as the stall process is instigated, controlled, and recovered from. When I was inexperienced, I tended to look upwards at stalls, they were the serious unknown, and filled with hazy-hazards. Now I can look down on them, and see them for what they really are – just another condition of flight, no more dangerous than any other, and certainly not something to be afraid of. Fear is a very poor platform for rational responses, quite the contrary in fact, and the purpose of this article is to encourage you look at stalls differently to aid in developing you own stall recognition and recovery expertise. My instructors taught me to fear stalls in the hope that that fear would keep me away from them. Their tutelage worked. It taught me that I was bad at stalls, I couldn't be sure of a safe recovery, and stalls only occur from slow deceleration, straight and level flight. Yeah Right!

But why do I say that stall practice might make an accident more likely? That's because the one thing that the repetition in most methods of teaching stalls have in common involves putting the aeroplane into that universal nose-high attitude. This gives inexperienced pilots the impression, subconsciously and overtly, that an aeroplane stalls if you try to stand it on its tail. For most pilots, over time, experience will re-teach that this is wrong! But why wait? You don't have to. To start adapting to this new concept, you first need to understand exactly why the current practice method is failing.

I can sum this up in one word – ***SURPRISE***. You have been inadvertently taught, and continued to inadvertently practise, that a stall event is always predictable. You inherently believe that stalls only happen when the nose is half way to Venus, **and** occur after a prolonged process to cause it to develop. While we are taught in the classroom that stalls can occur anytime, because that aspect is only infrequently taught during in-flight practice, that specific knowledge is overwritten by the hands-on exercises leaving the point lost and forgotten. Therefore, if/when a real and unintentional stall does occur, surprise will inevitably delay your identification of the issue, and decisions on recovery actions will be far slower than ideal, too often, hesitant at best. At low-level, surprise, hesitation, or inaction in stall recovery, are not habit forming. And the angle of attack only has to change by a few degrees for there to be no issue!

For myself, it has been the teaching of aerobatics to students that has illustrated this surprise factor to the greatest extent. The differing time reactions for students to recognise and instigate recovery action to a stall caused by pulling too aggressively up into a loop is much quicker than recognizing a stall when pulling out, with a low nose attitude. The obsession we develop with stalls always occurring when the nose is high comes back to haunt us.



A stall is less often recognised in blue aircraft position compared to red because of the low nose attitude.

We do take some remedial action, albeit inadvertent, to avoid the damage I am describing. Authorities require training in recovery from stalls in climbing turns and spiral-dives. Here the nose is certainly not level, and students are required to recognise the buffet at the stall onset and check forward to reduce the angle of attack to something below the stall. Recovery is commonly required either into a turn (descending, level, or climbing), or wings-level flight, maintaining altitude. However, this exercise is far too seldom carried out and any inherent lessons are lost in the multitude of nose-high practice stall memories the pilot acquires. Also, many pilots (including some instructors) are reluctant to carry out this exercise, fear dictates that they avoid it. Instead of practicing it, they tell themselves they are such good pilots that they will never encounter a surprise stall and so have already learned all they need. When the aeroplane is suddenly buffeting and the world is rotating in front of the windscreen instead of below, they are completely mentally lost. They have no idea as to what the reality and the cause of their situation is, just that it is brain-freezing. The student is completely frightened shitless – a point that should be recognised as being a complete failure in training. Student training should ensure that there is no confusion in manoeuvres that the pilot may encounter in real life, when there is no instructor to recover, only trusting passengers who have trusted their very lives to the "skilled hands" of their pilot.

Sifting through piles of statistics clearly shows two prime times for stall accidents. These are (in order of frequency):

1. Stall/spins occurring during the base to finals turn when on approach.
2. Stalls after take-off (aka departure stalls), and

Other and less frequent instances, include:

3. Stalling when initiating go-arounds,

4. Stalling due to a lack of attention to airspeed during approaches to land,
5. Stalling due to abrupt and over-controlled recovery from a sudden high sink rate on short final or,
6. Accelerated stalls, under high loading during overly tight turns.

In the base-to-final scenario, a spin often results. This is a vicious asymmetric stall in which one wing is deeply stalled and the other less so. The asymmetric lift and drag values on each wing inherent in this situation cause the aircraft to roll, pitch, and yaw simultaneously. When the pilot is sitting there, fat, dumb, and happy, thinking about iced coffee and a pie in the Café after landing, is suddenly looking at a technicolour world rotating directly in front of the aircraft, and a mindset that stalls only happen when the nose is high, he/she is loudly clamouring to engrave their name on the statistics lists. And their very training is at least partly to blame!

Relationships with bank and stalls can be as deadly to manage as marital ones. When an aircraft rolls the angles of attack on each wing are different because of the action of the ailerons. Once banked and turning, the combined angular actions of the turn and the descent will ensure that the angles of attack on each wing will, again, be different. Then, when ailerons are applied to roll out of the turn, AGAIN the angles of attack will be different. Add to the difference in angles of attach an out-of-balance condition where there is yaw towards the wing with the higher angle of attack and a snap roll and spin is not only likely, if the airspeed is also a little low, it's inevitable. Imagine rolling inverted, uncommanded, during the turn onto final and trying to mentally catch up with the aircraft. Not a tall order? Isn't it a good thing that aeroplane only stall when they are nose-high?

The aeroplane is rolling violently, the nose is pointing vertically down and there's only a few hundred feet. Time to recover is of the absolute essence. The pilot, ignorant of the developing stall, tries to roll out with aileron opposing the roll. But the aileron application on the stalled wing only intensifies the depth of the stalled state and, effectively, a control reversal takes place which further increases the rate of spin rotation, not the desired and expected reverse. But the aircraft can't be stalled – the nose is right down! It's vertical!

Had that pilot maintained adequate airspeed, and used coordinated ailerons and rudder during the turn they would have completed the turn and landed safely. Instead, the pilot set themself up for a stall, and failed to recognise it when it occurred. Then, worst of all, they didn't take the appropriate action to stop that stall from developing. Instead, in surprise, they applied totally inappropriate control inputs and aggravated a controllable issue into fatal one.

Of course, sitting here, it's easy to see that the aileron response above cannot remedy the issue. The correct recovery, after the event has commenced, is to close the throttle and apply rudder to reduce the rate of rotation, with forward stick to unstall. If good luck is still in the pot, there may be enough height to pull out of the vertical dive, but that's a matter for conjecture. Notice that aileron doesn't even get a mention!

Then, what about the occurrences when an aeroplane is in a very rapid descent on final approach. A steep approach into a short field so the airspeed is low, and a wind gradient suddenly increases the rate of descent. The pilot sees the threshold rushing up to embrace him/her and snatches the stick abruptly back. Then, what would have been a simple gentle attitude correction with perhaps a little added power, now becomes an irretrievable stall and crash. This is the textbook stall-on-short-final: low but initially adequate airspeed, and nose-low attitude, followed by a loud noise and then dead silence. But how could a stall be the cause – stalls only happen when the nose is high against the horizon, don't they?

To resolve the issue, trainee and qualified pilots need much more exposure and practice to encountering stalls in other than the common nose-high exercises currently endorsed and encouraged. Aerobatic training will certainly help, but many pilots train on non-aerobatic aircraft.

Also, recreational registered aircraft are precluded from any manoeuvre where pitch exceeds 30° or roll beyond 60° is deliberately applied. Spiral descents would still be an option here, though.

Pilots need to drop their fear-of-stalling mental condition, and realise that no deliberate stall is dangerous. Modern aeroplanes, loaded correctly and not subjected to severe control abuse at or close to the stall, CANNOT spin – their certification processes eliminate this risk. And even if they do drop a wing/incipient spin, a complete release of controls will inevitably see that modern aircraft "fall" out of the problem and become immediately and normally controllable. The scary tales of aircraft engaged in stalling practice falling into uncontrollable lethal spins are fairy tales, modern designs have removed this possibility. However, many instructors encourage such myths using such stories as a means of driving their students into correct behaviours. Instead, these instructors frighten their students to death, maybe literally! Of course, to the uninitiated, things do get dramatic during spins; the side-loadings, rapid rotations, the world standing up in front of the windscreen, all combine to frighten the hell out of someone not familiar with them. But no-one has to let a spin develop. In fact, modern certified aeroplanes cannot get certification if they DON'T fall out of an incipient spin. The early production Piper Tomahawks were a great example of this certification process. The first versions would spin stable, but after a number of fatalities, Piper were forced to add flow strips inboard, along the wing leading edges to remove the spin stability so they would *fall out* at any stage with control release. However, any pilot proficient in recognising the onset of a stall, and immediately recovering from a wing drop condition, will never see a spin. The aeroplane will only spin if the pilot continues to hold the relevant controls in a pro-spin condition. What's the problem? Except that surprise and ensuing panic can do funny things to people.

Statistics also tell that most times when a pilot enters an unintentional spin (probably somewhere around 80 percent of occurrences), it happens when the aeroplane is already at or below the circuit height. Most such incidents involve single-engine, fixed-gear aeroplanes and usually happen either shortly after take-off, or, more likely, when turning from the base leg onto final. I have very rarely seen or experienced a non-deliberate spin during manoeuvring flight (and then, only in a Piper Cub – not a modern design). The wing-drop issues and incipient spin potential were the result of using either the wrong rudder to correct yaw in a wing-drop stall, or using aileron to pick-up a dropping wing before instigating the stall recovery.

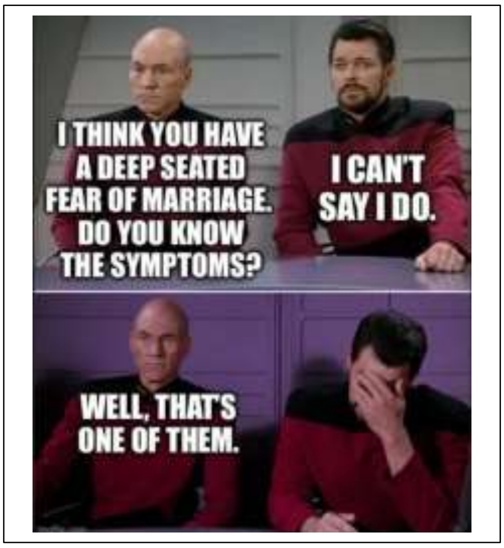
In conclusion, we must continually remain aware that real-life stalls occur under a much broader set of circumstances than in the narrow range of scenarios we practice them in. The only thing even relatively fixed about a stall is the critical angle. Stalls can occur at any airspeed, and in any condition of flight, or nose attitude.

The final lesson is that, if you ever feel an unexpected buffet, or that sudden change in stick/yoke feel as the centre of pressure moves along the chord with the breakdown in airflow, immediately check forward to reduce the angle of attack until you can prove that you aren't the beneficiary of an inadvertent stall. Only after this should you consider something else.

Happy Flying

Fly-Ins Looming

WHERE	EVENT	WHEN
Murgon (Angelfield) (YMRG)	Burnett Flyers Breakfast Fly-in	**Find Next Planned EVENT AT** **http://www.burnettflyers.org/?p=508**



The Days of Our Lives (From a Flying Instructor's perspective).

By Rob Knight

As an employee of an Incorporated Society (Aero or Flying Club), you can only watch in dismay at the shenanigans of the Club committees and elected Officers. Even though you, as a servant, can suffer immeasurably at their whims, you cannot have any control whatsoever over them or their actions.

At one Club I worked for an AGM elected a new president. He was a young man, with a pleasant personality and I hoped that he'd do well. He was a newly qualified PPL, his training done by us and he was, in fact, a personal friend. He was employed by his parents on their extensive dairy farm in the Waikato area in New Zealand.

Initially, all was good. He was easy to deal with and he exercised good management of the regular committee meetings. He had the respect of the other committee members and their collective decisions were in no way controversial. Then, on a whim, he decided to leave his parents employ, and become a businessman, owning and running a non -franchised fast-food outlet. It promised better money and break from being under his father's rather demanding control.

A fellow committee member, probably the wealthiest Club member we had, was offered shares in the business but declined, instead offering, very generously, to underwrite the extra cash the president needed to buy the business outright. They did their deal and, as a Club, we supported the President's business by frequenting it very regularly.

Adrian was flourishing, and the smell of roses hung in the air even though it was early winter. The first month went by and we saw Adrian with hands full of cash and a fat wallet paying for his flying. His hours went up and he got checked out in the Club's Grumman AA5B Tiger, ZK-DLJ, our flagship, and his smile was beaming.

The second month passed. No issues; it all looked like another success story and Adrian's flying hours increased as he took the aircraft away for several days at a time, all on his closed business days.

The evening on which the third committee meeting was to be held arrived. We all attended and waited for him. His business closing time was later than our usual meeting start, so it was not unexpected that he'd be late. But at 9pm, after one of the members had driven to his house and seen it had no lights on and his knock went unanswered, the Secretary opened the meeting, recorded the president's non-attendance, and closed it again before going home.

I never saw Adrian again. He'd pocketed the money from his patrons (including us) and done a runner. As the fellow committee member was not having his loan serviced, he involved the Police and a warrant was put out for the president's arrest. I understand that they found and arrested him in Bluff, the southernmost town in New Zealand. As his signature was compulsory on all Club cheques, the club had a rush on its hands to get the signatories changed through the required legal process and it was quite embarrassing all around. For some time, we had to field rumours that he absconded with the Club's funds but that was not the case. Adrian was gone. Funnily, though, his replacement was another young man – actually a condom salesman – and he presented quite another, completely different, set of challengers to the Club and its management.

WTF - The World's Worst Aircraft – the Focke-Wulf Condor of 1937

By Rob Knight


FW 200 Condor, Design failure caused broken back.

Reputedly nicknamed, "The scourge of the Atlantic", on its first appearance as an aircraft in service in the Luftwaffe, the Focke-Wulf Condor was merely a civilian airliner, operated at weights and under wartime conditions for which it was never designed. Coming off the drawing boards as a civil airliner, the design's limit load factors were totally inadequate for it to carry such localised weights as bombs, protective and attack machine guns and armour plate to protect crew members. Especially, and most worrying, was its propensity to suffer a complete fracture and failure of the rear fuselage, just aft of the trailing edge wing root.

By 1942, design improvements had addressed these shortcomings, but the aircraft faced serious opposition from heavily armed Short Sunderlands and Consolidated Liberators in the oceanic combat roles. Their serviceability statistics, never great, was not improved and many aircraft were called to service as transports on the Eastern Front in the war against Russia. In particular, in the battle for Stalingrad. In this role the FW 200 was just as poorly suited, as the floor area over which the loads could be distributed to maintain an appropriately satisfactory centre of gravity position was, again, limited, and the airframe structures continued to fail with dangerous though accustomed familiarity.

However, in one wartime role the aircraft excelled. This was the arena of long-range maritime reconnaissance for collecting weather data. Here the aircraft performance was perfectly adequate and, as they were essentially unarmed, the structure was not being operated beyond its design limits. The Condor's range made its performance here exemplary, it could leave Bordeaux in France, fly to the mid-Atlantic, and return to German-held territory in Norway with reserves to spare. To counter the aircraft in this long-range oceanic role, the allies had to station twin-engined Bristol Beaufighters in Ireland and use the greater defence capacity on the Royal Navy's escort carriers e-convoy in the Atlantic. These ship-borne fighters were able to limit the damage caused by the Condor's operations to a great extent.


FW 200 Condor, fitted with torpedo and gun turrets.


The F 200 cockpit and panel.

------ ooOOoo ------

Keeping up with the Play (Test yourself – how good are you, really?)

TAF AMD YAMB 281902Z 2819/2912
VRB03KT 9999 BKN006 FM282200 32008KT 9999 SCT030 BKN040
FM290200 36008KT 9999 -SHRA SCT030 SCT040
INTER 2903/2912 3000 SHRA BKN010 PROB30
TEMPO 2903/2912 VRB25G40KT 1000 TSRA BKN008 BKN045CB

From the YAMB TAF details above, please answer the following general questions.

1. To what AEST time is this FCST valid?
   A. 1200 hrs.
   B. 1000 hrs.
   C. 700 hrs.
   D. 1300 hrs.

2. At what AEST is the worst forecast weather expected to arrive at YAMB?
   A. 0300 hrs.
   B. 1300 hrs.
   C. 1200 hrs.
   D. 0900 hrs.

3. What cloud base is forecast to exist over the station at 1100 hrs AEST (1100 AEST = 2100z (on previous day))?
   A. 800 ft AMSL.
   B. 4000 ft AMSL.
   C. 1000 ft AMSL
   D. 3000 ft AMSL.

4. What is the earliest AEST time the predicted weather is expected to fall below VFR minimums?
   A. 1100 hrs.
   B. 1200 hrs.
   C. 1300 hrs.
   D. 1400 hrs.

5. If you planned to pass through this station at 1330 AEST, what is the worst weather predicted at this time? (1330 AEST = 0330Z)
   A. 3 to 4 oktas at BOTH 3000 ft and 4000 ft AMSL, with showers and 9999 metres visibility.
   B. 5 to 7 oktas cloud at 1000 feet AMSL with showers and 3000 metres visibility.
   C. 5 to 7 oktas cloud at base 800 feet, 1000 m visibility, wind variable at 25 kts but gusting to 40 Kts.
   D. Wind variable at 3 kts, 9999 m visibility, and 5 to 7 oktas cloud at 600 ft AMSL.

If you have any problems with these questions, call me (in the evenings on 0400 89 3632) and let's discuss it. Ed.

ANSWERS

Convert Zulu times to AEST

TAF AMD YAMB 28**1902Z**[**0902 AEST**] 28**19**[**0900 AEST**]/2912[**2200 AEST**]
VRB03KT 9999 BKN006
FM28**2200**[**0800 AEST**] 32008KT 9999 SCT030 BKN040
FM29**0200**[**1200 AEST**] 36008KT 9999 -SHRA SCT030 SCT040
INTER 29**03**[**1300 AEST**]/29**12**[**2200 AEST**] 3000 SHRA BKN010 PROB30
TEMPO 29**03**[**1300 AEST**]/29**12** [**2200 AEST**] VRB25G40KT 1000 TSRA BKN008 BKN045CB

Note: times zulu are in **BLACK**, times AEST are in RED

If in doubt, use the details available linked via the 

icon located at the top right on all electronic versions of a TAF.

1. B is correct. 1000 hours AEST.
2. B is correct. 1300- hours AEST.
3. D is correct. 3000 FEET AMSL.
4. C is correct. 1300 hours AEST.
5. B is correct. 5 to 7 oktas cloud at 1000 feet AMSL with showers and 3000 metres visibility.

------ ooOOoo ------

Aircraft Books, Parts, and Tools etc.

Contact Rob on mobile – 0400 89 3632

Books

Title	Condition	Price
PPL Navigation, by Trevor Thom	Good condition	**$15.00**
PPL Basic Aircraft Technical Knowledge, by Trevor Thom	Excellent	**$15.00**
Manual of Aviation Meteorology, by the BOM	Excellent	**$15.00**
Human Factors in Flight, by Frank Hawkins	Excellent	**$15.00**
Aviation Medicine and Other Bhuman Factors, by Dr Ross L. Ewing	Excellent	**$15.00**

Aircraft Magnetic Compass (Selling on behalf)

Item		Price
Magnetic compass: Top panel mount, needs topping up with baby oil.		**$45.00**

Propeller Parts

Item	Condition	Price
Propeller spacers, Assorted depths, all to fit Rotax 912 UL/ULS propeller flanges	Excellent	**$100.00 each**
Spinner and propeller backing plate to suit a Kiev, 3 blade propeller, on a Rotax 912 engine flange.	Excellent	**100.00**

For all items, Contact me - on mobile – 0400 89 3632

Or email me at:

kni.rob@hotmail.com

Aircraft for Sale

Kitset - Build it Yourself

Reduced Price

$1,480.00 neg

DESCRIPTION

All of the major components needed to build your own aircraft similar to a Thruster, Cricket or MW5.

- Basic plans are included, also
- Hard to obtain 4" x 3" box section, 2 @ 4.5 metres long.
- Wing spar & lift strut material - 6 tubes of 28 dia. x 2 wall.
- 20 fibreglass ribs plus the moulds,
- 16 spar webs plus the moulds,
- 2 fibreglass flat sheets for the leading edges - 4 metres long x 1.1 metres wide.
- A ballistic parachute,
- A 4-point harness,
- Set fibreglass wheel pants, and
- More.

Box sections and tubes

A very comprehensive kit of materials

Support parts – Harness etc.

Colin Thorpe. Tel: LL **(07) 3200 1442**,

Or Mob: 0419 758 125

Ribs, tubes, spats, etc

Aircraft Grade Bolts for Sale

Aircraft AN Bolts - $500

AN3, AN4 & AN5 bolts, all bagged
- 500 bolts in total.

Today's cost – approximately **$5,500**

A list can be supplied if required

Contact Colin Thorpe –

0419 758 125

Sky Dart Single Seat Ultralight for Sale.

$4,500.00 NEG

A single seat, ultralight, Taildragger. Built in 1987, this aircraft has had a single owner for the past 18 years, and is only now I am regretfully releasing it again for sale. I also have a Teenie II and am building another ultralight so I need the space.

The landed Sky Dart III rolling through at YFRH Forest Hill

TTIS airframe is 311 hours, and the engine, TTIS 312 – is just 1 hour more. Up-to-date logbooks available. 2 X 20 litres tank capacity. To be sold with new annuals completed.

It is easy to fly (for a taildragger), and a great way to accumulate cheap flying hours.

Call me to view, Bob Hyam, Telephone mobile 0418 786 496 or Landline – 07 5426 8983, or Email: bobhyam@gmail.com

Landed at McMaster Field after my flight back from Cooma just West of Canberra. In the cockpit with me is GeeBee, my dog

Single Seat T84 Thruster, disassembled and ready for rebuild.

I have a T84 single seat Thruster project in my hanger at Watts bridge.

The fuselage is on its undercarriage, the wing assemblies are folded up and the skins are with them.

Included is a fully rebuilt Rotax 503 dual ignition engine and propeller.

And, most importantly – the aircraft logbook!

Asking price $5000.00

Contact John Innes on **0417 643 610**

2000 Parker Teenie Two for sale

NEW PRICE$9,500

- ✓ TTIS 70 hours airframe.
- ✓ Engine: 1835 cc Volkswagen with dual ignition and dual spark plugs, Slick mag, and 12-volt electronic ignition.
- ✓ Built by original L.A.M.E. owner.
- ✓ Price includes weatherproof storage/transport trailer so no hangarage is required.

I purchased the aircraft in 2020 intending to enter Recreational flying, but due to work and study commitments, it never eventuated.

The aircraft last flew in 2017. I start the engine every three months and have serviced it yearly. It really needs to go to someone who can enjoy her.

Contact me, Jared Tucker, at jaredtucker1998@gmail.com,

or call me on **0450 233 263**.

See you next month