# BRISBANE VALLEY FLYER

## July - 2021

www.bvsac.com.au

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

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The Boeing MQ-25 Singray – a portent of the future . *See page 16*

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# From the Club


Hello all,

Warning:

The latest lockdown has been decreed as lasting for a duration of three (3) days. However, it also contains the proviso that It may be extended to a longer period. Perhaps as long as 30 days

As this lockdown limits personal contact and movement, it throws into jeopardy social gatherings etc, the primary ones for the near future being the Brisbane Airshow at Watts Bridge memorial Airfield and the BVSAC club activities.

**Note that the Brisbane Airshow has been postponed to the 16th and 17th of October 2021.** See notice on page 18.

For details on BVSAC meetings etc, contact Peter Ratcliff, the BVSAC President. His contact details are listed on the bottom of the front cover of this magazine.

(Editor)

# The E6B, Damned Good, or Dead Dinosaur

By Rob Knight

Flying at any time we can see our destination makes navigation easy. Just put the place we want to go over the spinner and wait for it to arrive. However, when the place that we want to go to lies over the horizon, or is otherwise obscured from visual sight, we need to use other methods – GPS is the modern one, or dead-reckoning, it's older relation.

Dead reckoning navigation relies on gathering pre-flight data and using it to calculate a heading to fly and the ground speed which is necessary for fuel calculations and other things such as available daylight etc. In keeping with all data gathering, the accuracy of the end calculation results will be highly influenced by the accuracy of the data gathered. Some data must be gleaned from charts (track to follow and distances), other data is sourced from the relevant weather forecasting service for the area in which the flight is to occur.

There is nothing new here – all the previous pre-amble should be already well-known as dead-reckoning flight planning is part of every pilot's training. Any competent pilot will be able to calculate an appropriate track (according to required destination location and magnetic variation, and intervening obstacles including weather conditions and airspace restrictions appropriate to the type of flight). They will also be able to correctly ascertain the relevant weather conditions for the time and locality.

For pre-flight planning, the pilot's ultimate aim is threefold:

1. to acquire a heading to follow to maintain the track desired to get to the desired destination,
2. to have an anticipated flight time, and
3. to know how much fuel will be required to safely carry out the planned flight.

And the typical instrument of use for these tasks is the E6B flight navigation computer. Its design use is to provide a graphic presentation of the track direction and the effect wind will have on an aircraft following that track. This is called a wind triangle, and will, in turn, allow the calculation of a drift angle (or wind correction angle) to compensate for the directional issues of the wind, and a visual depiction of the ground speed to be achieved whilst progressing along that track. The same conclusions can be met using paper and vector diagrams, but the E6B slide rule takes up little space and is thus cockpit-friendly – no navigator seat needs to be provided.

There are several methods of entering the data onto the E6B and reading the results. The oldest one, commonly called the "Kane Method", is thus named because the Kane company in the USA grew rich making most navigation slide rules for aircrew after WW2, and the wind triangle method they listed in their instruction book became the standard for all. This is the method I was taught in the 1960s doing my PPL: and CPL training. However, their method has proved to be neither the easiest, nor the most accurate, so no longer features in many ground school training centres. A result on my 53 years of dead-reckoning navigation instructing is the concept that easiest is best when avoiding confusion and errors, and I use a newer wind triangle presentation method for both my own use and when teaching on the E6B. The method that I now use is known as the 4-step method and, as the name suggests, takes just 4 simple steps to insert the data onto the E6B face and to read it off.

The data that I need to pre-determine the heading to fly (Hdg), and the speed of the aeroplane across the ground (G/S) is:

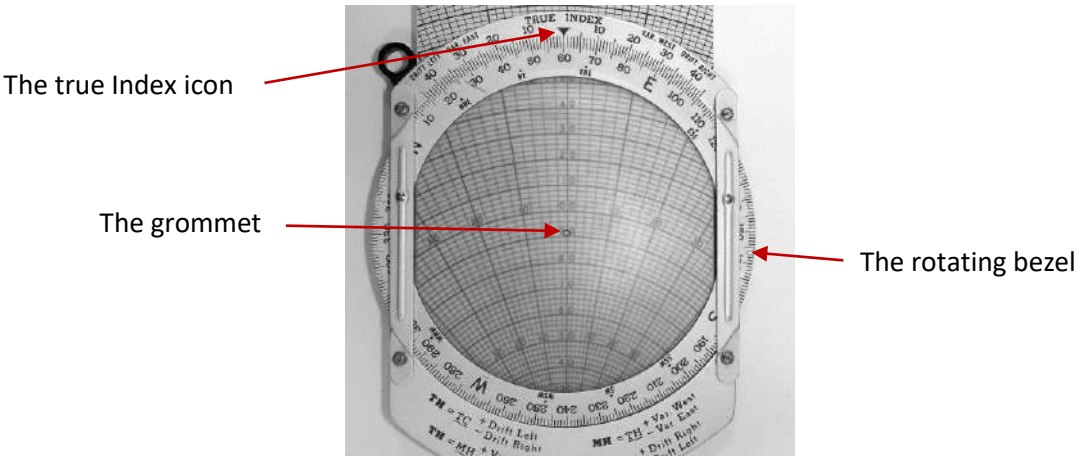
1. The track that I intend to fly along,
2. The wind velocity in that part of the atmosphere, and
3. The true airspeed (TAS) of the aeroplane.

For the purposes of this exercise, I use the following data:

I have ascertained my desired track is **120°**.
I anticipate that my aeroplane will be flying at a **TAS** of **80 knots**, and
The wind velocity forecast indicates that I will experience a wind velocity of **060/10** knots

Caution – a common error is to fail to ensure that the directions (track and wind direction) are in the same units – either true or magnetic. Before entering and reading data from the E6B, the units MUST be the same or gibberish will result

## To find the Heading and Ground Speed given the above track, TAS and W/V




*The Wind correction face of the E6B*

1. Rotate bezel until the wind direction lies under the TRUE INDEX at the top of the E6B
2. With marker, put wind dot above the grommet (centre of the circular face) at the number of knots of wind speed.
3. Rotate bezel again until the required track lies under the TRUE INDEX
4. Move slide until marked wind dot lies over TAS arc.

With the above completed, read the drift angle laterally from the centreline of the E6B face. *Caution the scale between the radiating lines varies, sometimes 1 degree, sometimes 2 degrees.*

Now Read the Drift

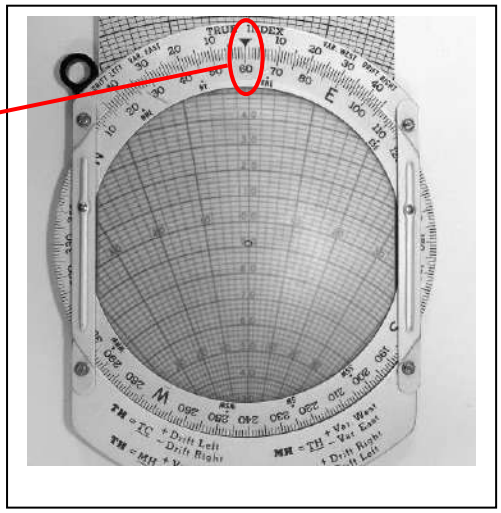
The wind dot lies on the 3rd graduation to the left of the centreline. As each graduation on this part of the scale equals two (2) degrees, 3 graduations = 6 degrees. This means the heading lies 6 degrees to the left of the track.

Look at the True index. See the scale above it that expands both to the left and the right. Count around 6 degrees left from the track and read the heading. In this case therefore the heading will be **114 degrees**.

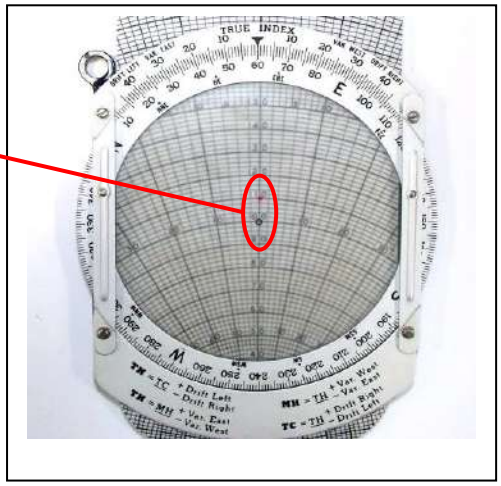
Read the Ground speed under the grommet. In this case under the grommet is 74, so the Groundspeed is **74 knots**.

Let's see that in pictures.

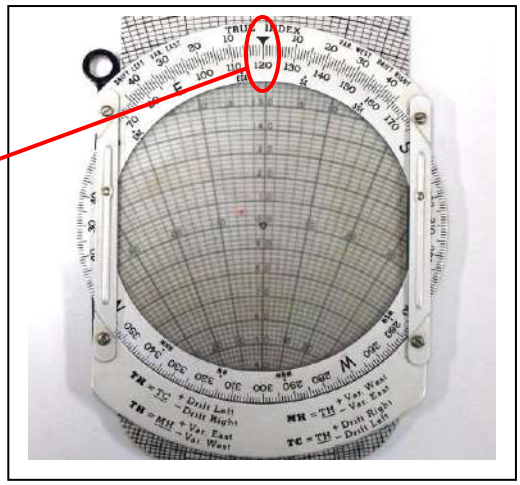
Step 1. Rotate bezel until 060 lies under the TRUE INDEX

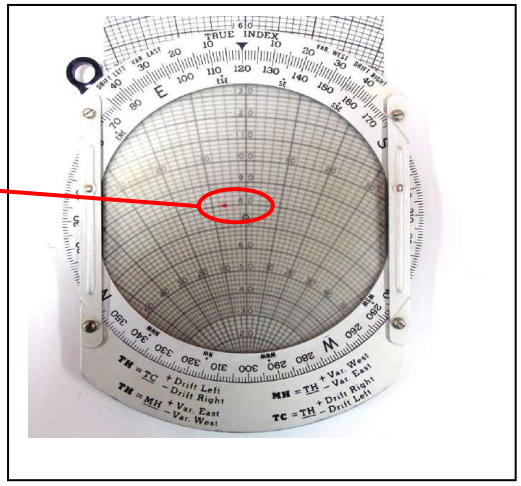


Step 2. Mark wind dot 10 units (for 10 knots) above the grommet.



Step 3. Rotate bezel until track of 120 lies under the TRUE INDEX.



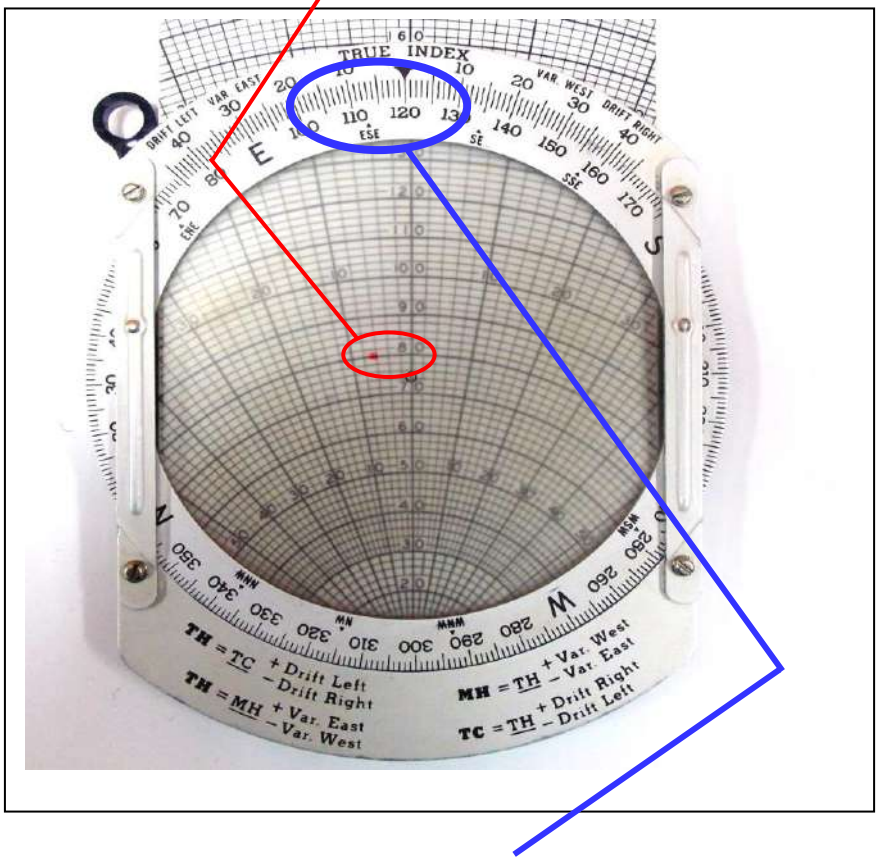


Step 4. Move slide until wind dot is over TAS arc.

The E6B is now set up to read the wind correction angle to correct the drift, extract the heading, and view the groundspeed without further movement.

Reading the heading from the wind dot.

The wind dot is showing six (6) degrees of **LEFT** wind correction for drift is needed.




Because the wind dot is now left of centre our heading will need to be left of our track. Our track is 120 so, to counter drift, our heading will be to the left of the track by 6 degrees. Look at the TRUE INDEX and read under the scale **six (6) degrees to the left**. This indicates that a heading of 114° is required. Alternatively, you can just subtract 6 from 120 and also reach the heading of 114 degrees.

If our data had been different and the wind dot lay to the RIGHT of the centre line when our track was set under the True Index, the correction would have been to the RIGHT and we would have needed to count around to the right or add the correction to the track to find the heading.

The process that I have depicted above is the simplest means that I am aware of to use the E6B. With practice it is faster than inputting the details required into an electronic means of calculation. Some claim that electronic calculation machines are safer but there are several flaws in this. The forecast wind velocity is rounded off to the nearest 10 degrees in direction, and 5 knots in speed. So even a heading provided to three decimal places is irrelevant as the aircraft compass is carded to only 5-degree increments. Anyway, many of the pilots that claim the E6B cannot be seriously considered against electronic methods because of accuracy, cannot keep an aeroplane in flight straight to within 10 degrees over any prolonged period anyway so their argument is spurious at best.

The E6B is “the old way”, but that doesn’t automatically make it the wrong way. The E6b cannot fail: it has no batteries or other power system, and it makes a pilot look at his/her world when gathering the data for the proposed flight. Entering flawed data into an electronic provider can lead to fatal accidents more easily that the old slide rule, as people are less likely to trust the slide rule outputs over blindly following a purple line on a screen as darkness gathers outside the cockpit, or the fuel gauge needles touch “E”. Both electronic devices and slide rules are prone to providing flawed output from flawed input, but it is less likely to escape the notice of the slide-rule user than accident statistics indicate it is to the electronic button pusher.

A different type of slide rule, a purely circular one, is produced by Jepperson in the USA. These are generally smaller and this pocket-sized, and use a different, trigonometrical, means of solving heading and groundspeed problems without the centre slide of the E6B. I will look at using one of these next month.

Happy Flying

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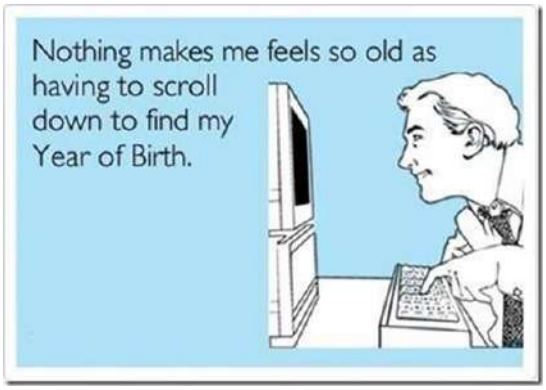
Question:

How come a car park makes more money than I get paid on my pension?

Question: Define “frustration”

Frustration is trying to find your glasses without your glasses.



## How to Find a Good Flight Instructor (or Break Up with a Bad One)?

Adapted from an article by Dale Smith, **Aug 3, 2019 (Plane and Pilot magazine)**

Many flight instructors don't know how to prepare you for your practical flight test; moreover, some don't care. How to tell the difference.

Many primary flight training customers come to training with the assumption that all instructors are pretty much the same, and training success is determined almost entirely by the talent of the learner. But it's not true.

Instructors come in a number of varieties. Many become qualified to build needed hours for their next flying job, and often those follow-on flying jobs are dictated by airline hiring. If the major airlines are hiring, they draw from regional carriers, and those companies hire, in turn, from the general pilot population. The number of flight hours you need varies with different carriers and is significantly influenced by the number of seats that carrier needs to fill.

I can remember an era when you needed 3,000 flight hours, an ATP certificate and a type rating to even submit an application to a major airline. If you made it through the interview, you would be subjected to a physical exam by its company doctor that would rival one a NASA astronaut endures. I can also remember when you could apply with some regional carriers if you had 300 hours and a commercial pilot certificate and could fog a mirror.

Then, as now, the place new commercial pilots start building those hours is flight instruction. This means that for many pilots, flight instruction is an entry-level job. These folks are building hours on your dollar and may not have developed the skills they need to be good at the job.

In short, go into this with your eyes open. Some flight instructors are dedicated to doing a great job, which means getting you ready to succeed at your flight test. Some are farming you for their hours.

Since you may not know how to evaluate whether the person you are going to be spending a lot of time and money with is going to help you achieve your flying goals, here's a checklist of things to consider.

So maybe it's time to have a sober-eyed look at your CFI's performance and have a talk with them to get some important details you won't learn about otherwise. Make it an interview, asking any questions that you might have, questions such as:

1. What is the company's conflict policy resolution when personality issues appear between instructor and student?

2. If the training course is across a fixed calendar time, how will issues be addressed if weather or aircraft maintenance issues make adherence to the time frame impossible?

3. Will the training be given by one primary instructor or will I be shared across a group of instructors?

The answer to each of these questions will assist in your decision as to whether to go forward with them or look elsewhere.

That said, here are the yardsticks by which to measure your current or prospective CFI's performance and/or potential, as well as some questions to ask them before making this important decision.

Remember, your CFI may be new to the game, but that doesn't mean they aren't a good instructor. So, don't expect perfection, but do expect them to be in a position to help you achieve your goal—getting that ticket. Expect straightforward answers to all questions. The only dumb one is the one that you fear to ask

By all means, read the advertisements for flying training, but one word of advice before that. Don't sign up for the first flight training school that you see advertised. Look carefully at as many training establishments as you can find. and check what reviews are available for each of them. Some providers may offer spectacular products that allow you to study at home for a cost far less than you would spend attending a traditional ground school.

Also, you should fully expect your instructor to develop your knowledge by using scenarios. You will need to use the information you learned in your theory training to gain a "pass" in the ground portion of the practical flight test as the examiner will require you to recall and use theory course information in different situations to assess your ability to operate after you qualify and carry the responsibilities of a qualified pilot

Your instructor should provide practice at the practical flight test so when the day finally arrives, it's not the first time that you have faced someone in an examining role. Having been an examiner for a decade and a half, it became plain to me that some instructors and training establishments simply ran their students through a production-line training course and then threw their client at an outsider for a test where the candidate sank or swam according to their latent abilities. Pre-flight-test training is a very important part of the preparation for the culmination of your training.

Some flight training establishments provide simulators to reduce training costs as simulators cost less than real airplanes. This is very valid for the "procedures" parts of the training syllabus but can have a reduced effect on the hands-on, physical aspects of VFR flight training.

You should expect to do most of the flying. Some instructors are "control hogs", and are more interested in showing you how well they can fly rather than giving you the stick or yoke so you can improve your skills. You are paying them to teach you, not to over-demonstrate their own skills. Remember- - it's your skills that will need to be demonstrated when you sit your flight test.

The normal process for lesson-based flight training is to provide a briefing before the lesson. The room should have no distractions and be quiet and comfortable in terms of both air temperature and furniture. The briefing should be personalized to suit you and your background. The topic list should be comprehensive and include:

1. the intended outcome (or aim) of the lesson,
2. the relevant principles of flight to the necessary level of understanding for the exercise being briefed on,
3. appropriate knowledge of the airmanship and human factors being presented in the particular lesson, and
4. a thorough presentation of the manner in which the controls and the airplane must be operated to achieve the outcome expected.

During the flight following the briefing, the instructor will normally demonstrate the exercise and patter his actions necessary to achieve the task. Patter is the talking part of the lesson where the

instructor is talking the student through the lesson. Then, after judging the student's understanding of what is required to be done has reached an appropriate level, the instructor will hand over control of the airplane to the student. This is a formal procedure to ensure that both student and instructor know who is flying the airplane. In practice, the instructor says, "You have control". This means the instructor is expecting the student to take over the controls, both hands and feet. The full procedure then requires the student to say (in return), "I have control" and thus acknowledge that they now are ready to use the controls*. (Note that in RA-Aus training in Australia, it is also common to use the statement, "Your aeroplane", for the student to take over control, replied to with, "My aeroplane" by the student to acknowledge of his/her taking control of the aircraft. Ed))*

As many exercises or lessons will require practice to attain the necessary proficiency, a good instructor will coach the student through the task, from taxi to landing. Simulator practice may be an advantage for some flight or ground exercises, which may translate to a reduced time to learn the required skills but personal application has a far greater effect on the time it will take to learn to fly.

In the air, the instructor should spend most of the time in the airplane explaining how to do it. There are three simple steps to effective flight instruction: what, why and how. The what and whys should be covered in the briefing; it makes no sense to get in the airplane to introduce a task if the student doesn't already know what is to be achieved and why it is necessary to learn the particular skill you are trying to achieve. In the airplane, it's the hows that make it

The last point that I'd like to make is depict what is possibly the most contentious issue in being a good instructor. It's how the instructor presents the issues that develop during training whilst the student has control. Too many instructors never instruct students on how to do a task after the initial exercise; they just tell the student what they did wrong. "You were high on final," "you need to stay on centerline when you taxi," "you touched down too hard," the list is longer than a light-year. A "check pilot" will tell you what you are doing wrong, but it's an instructor worth his/her salt that will, instead, tell you how to do it right. If your instructor isn't explaining to you, not showing you, how to do the task right, and they merely criticise you for errors, they, themselves, don't yet understand the learning process, and you, the student and client, are wasting a lot of your time and YOUR money. Fire them. *(This is a fundamental cause of bad instructing and must be addressed by Chief Flying Instructors overseeing the junior instructors they are supervising. Ed)*

In my opinion, the most important aspect of successful flight training will be based on the relationship the student has with their instructor. If your instructor isn't treating you with the time, energy and respect due you as a valued customer, one who is funding their flight hours, fire them immediately. After all, it's your money.

Don't misunderstand—good instructors, as well as bad, come in all ages and experience levels, and any worth your money will have no problems having an honest discussion of these topics.

*Comment*

*A student pilot in NZ presented herself for a PPL flight test. She was a senior accountant with a second degree in Company Management so had a good IQ. Her training had been done at a school with which I had no involvement and I was delighted that initially her handling of the PA-38-112 Tomahawk was perfectly acceptable for that level of license, and I was ticking all the boxes on her flight test form as the exercise progressed.*

*Then I asked her for a basic stall with a recovery at the stall warning. She became nervous but provided a good result. However, as we progressed through the more advance stalls, she became more and more apprehensive. When I requested a fully developed stall with a wing drop, she burst*

*into tears and refused to do that exercise. Warned by her already rising apprehension, but disappointed by this refusal, I had no option but to terminate the test and took over while she recovered her composure. She flew me back to the Wellington Aero Club where we de-briefed.*

*A careful discussion with her over the ubiquitous cup of tea brought out her deep-seated fear of entering an inadvertent spin during a wing drop stall recovery. This fear (almost a phobia) had been generated by her somewhat loosely supervised instructor who had a tendency to shout words at high speed during his pattered criticism of her efforts to fly. Instead of breaking down the control actions to recover, he simply shouted at her, too fast for her to act on his instructions. He had then told her that she was useless and would probably kill herself. He then had demonstrated two developed spins with recovery only after several rotations with no prior briefing which simply scared her sh*t**ss and did colossal damage to her opinion of her abilities. An hour of dual with a competent instructor saw her pass the PPL test with flying colours.*

*When I instigated a discrete enquiry through CAA records, it turned out that the instructor had no endorsement for spinning, either as merely a PIC or as an instructor. His employer was embarrassed when it came to light and mortified to find that he had been demonstrating spinning to potential students during TIFS (trial flights in NZ). Needless to say, his instructing career came instantly to a grinding halt and the last time I ever heard of him he was pumping gas at a servo.*

*The woman PPL candidate concerned recently retired as a senior Captain with Air New Zealand. Ed*

*Lesson for today:*
*You go to an accountant to sort out your financial affairs to pay only the appropriate level of tax for your situation to the ATO. If you subsequently found they were not giving you advice that was serving this goal, would you keep them on, or go to someone else?*

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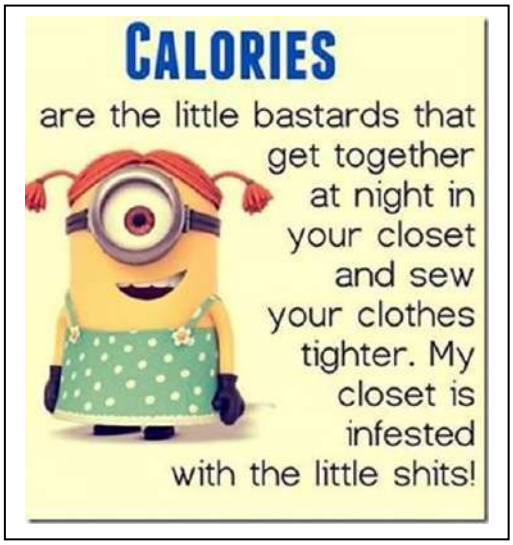


## Tiny Faults can have Massive Consequences

By Rob Knight

*While the incident depicted occurred whilst in IMC, the issue is relevant for all flight operations.*

March, 1988, I was airborne, flying off the balance of time I required to maintain my instrument rating. I was Pilot Flying[1], and on my right was a close friend, fellow instructor, fellow flight examiner, and retired RAF Avro Vulcan pilot, Dmitri Zotov. Dmitri was also maintaining his own required recent experience for his Instrument rating. The aircraft we were flying was an IFR certified PA28-151 – ZK-DSK, the basic instrument trainer for the Wellington Aero Club in New Zealand.

Dmitri had completed his required time flying from Wellington (NZWN) to Nelson (NZNS) and returned to Wellington via an NDB approach into Omaka (NZOM) at the top of the South Island. Conditions were IFR OK for us (we could operate below the freezing level) – BKN Cu, base 4500, tops to 10000 +, with the freezing level above 11000. As we have no airframe or prop de-icing capability, we preferred to remain below the freezing level.

Back at Wellington, Dmitry and I had a cuppa whilst I planned my flight. It was a simple IFR milk run from Wellington to RNZAF Ohakea (NZOH) for a (PRA) precision radar approach, followed by a missed approach and a diversion to Palmerston North (NZPM). After another missed approach procedure, I planned for a landing at Paraparaumu (NZPP) followed by a touch and go and an ILS approach into Wellington to end the flight.

Paraparaumu airport is only a few hundred meters from the beach, and an elevation of 20 feet AMSL. It has issues for IFR operations as the Tararua Ranges lie only about a mile to the west and these include Mt Hector rising to over 5000 feet. To the East, at less than 3 nm, sits Kapiti Island rising to 1710 feet while 10 nm to the south Pukerua Bay cliffs rise sharply to nearly 1000 feet, and its adjacent hills chase 1500 feet. To the north west is clear air for 100 miles until you experience Mt Egmont. I include these details to ensure it is clearly understood that terrain proximity adds to the hazards when making instrument approaches into NZPP.

My flight had all gone to plan and I was cleared by Wellington to enter the hold for runway 16 and maintain 5000 until IFR traffic ahead either declared "*Visual"*, or commenced a missed approach. I acknowledged and reported crossing the beacon (NDB) and commenced my right turn onto the prescribed timed outbound leg. There was little conversation in the cockpit – IFR ops require considerable concentration and I asked Dmitri to call Wellington for an update on the position of the traffic ahead. Wellington reported that the Twin Comanche ahead had reported descending through 3000, still in IMC. We were in developed cumulus cloud and it was quite bumpy, not severe but requiring constant effort to keep straight and maintain height and wings level. I crossed the beacon again and turned right. On completing the turn for the second time around the pattern, established tracking 348° outbound, the Cherokee cockpit suddenly began to fill with eye-watering, pungent grey smoke. After the normal human-style expletives questioning what was happening, Dmitri cracked the aircraft door and I opened all the cabin vents and the port side tiny pilot's window. This cleared most of the smoke from the front of the cockpit and through steaming eyes we scanned the instruments.

[1] Pilot flying (or PF) – recognised aviation vernacular for the pilot flying an aircraft in a two-pilot situation. The other pilot is the pilot monitoring (PM).

There was no indication of a fault from the instruments except for the ammeter which seemed locked on its maximum readout and the continuing thick flow of grey smoke from every vent and orifice above and around the instrument panel and facia.

I turned the ammeter Master switch OFF and asked Dmitri to call Wellington to alert them to our predicament. We were now on the inbound leg of the pattern and the reply to his call instructed us to remain in the hold and report our next crossing of the beacon, and did we want to report an emergency. Shaking my head, Dmitry reported in the negative and said that we'd advise.

By the time of our crossing the beacon the smoke had diminished as we were no longer pouring electricity at the fault, wherever it lay. However, to expedite the initiating of our descent, we declared an emergency. Now on battery power only, we had shut down all the electrical devices we considered we safely could. I reported "outbound" in the hold, and requested an emergency descent. After a brief pause Wellington replied, clearing my commencement of an immediate descent on returning to overhead the NDB and advising me that they had instructed the aircraft ahead to either break-off their approach and commence a missed approach immediately or, if they were now in VMC, to declare "visual", and allow us to commence our approach. Remember, the hills are close, we are being thumped around in thick cloud, and we had a cockpit filled with stinking, choking, electrical wiring smoke, and still had 5000 feet to descend before our wheels could be on the ground.

With relief I heard Wellington further repot that the Twin Comanche had declared "visual", and that they had broken cloud at 1900 feet QNH. Now we only had 3100 feet to descend before we could at least see outside the aircraft.

Those 3000 odd feet seemed to take 100 years in time. Through my mind was running the text from Ernest K Gann's book, "Fate is the Hunter" where his Captain Ross was holding a match under his chin whilst he made an instrument approach to force him to ignore the smell of smoke and the heat, and to solely concentrate on flying the instrument approach. It helped, and I was able to push the distractions aside and keep the instrument readings and needles where they were supposed to be.

We descended through 1800 feet – where does this bloody cloud end? Then, at close to 1700 feet, the cloud fell away and light filled the cockpit. We both raised our eyes and were relieved to see a clear path down to the white paint bars across the end of the runway.

We landed and taxied to the Kapiti Aero Club to be met on the maneuvering area by the instructor and student from the Twin Comanche that had been ahead of us. After we evacuated (the cockpit), they expressed their congrats and we looked under the instrument panel but could see no cause, just a black, melted and semi-melted mess of wires: DSK's IFR ops, at least, were over for a while. The Aero Club gave us each a coffee and a biscuit while I called Wellington tower to see if we could get an emergency clearance to fly the aircraft home. It would be


*A PA28 Warrior panel. The circuit breakers are on the right, below the control yoke.*

much cheaper to fly it home for maintenance than either pull the wings off and truck it back, or get it inspected and its VHF radio jury rigged to fly it over the ridge and back to Wellington within the law.

The controller, whom I knew personally, was rather amused and said that Wellington tower had never used its light signaling system so it would be a good test. He gave us a last-time-to-leave Paraparaumu, an instruction to maintain an altitude not in excess of 1900 feet QNH, and to carry out a 360° orbit at Whitby and more at Newlands. We should continue to orbit Newlands until we saw a green light from the tower before we continued. Receipt of the green light was to be clearance to land.

The return flight was quiet without the radio (Wellington is an International Airport) and without further event. The tower's green light lit up during our second orbit at Newlands, and the approach onto 16 was otherwise perfectly normal.

The fire was caused by a short circuit in the starboard pitot head de-icing heater AND a second failure in the "pop-out" circuit breaker that was supposed to protect the electrical system from just such a problem. The electrical engineer that repaired the aircraft stated that we would have had 45 amps DC pouring through the system which was why the busbar had semi-melted and dangled at nearly 90° to its original alignment. The episode was incredibly expensive, the re-wiring job cost close to 40% of the aircraft's value at that time.

*After DSK had a month in intensive care, I flew her to Omaka (VFR) to collect an instructor who was stuck there. I took the kids.*

The message from this – Some things cannot be seen or assessed at the pre-flight inspection stage of a flight, but can fail after the flight commences.

In my case, there had been no early warning of the impending failure; the first indication was the sudden out-pouring of eye-burning, acrid, choking smoke. When we later looked in the Flight Manual, there were no relevant instructions for such an event OR an appropriate checklist pertinent to the situation.

This tale serves to highlight the adage that pilots should always expect the unexpected, and, in the event of a failure, they should……..

first - keep the aeroplane flying, and
second – retain the attitude for flight, and direction for flight, that you desire.
Only after these have been achieved and can be maintained …….
THEN, thirdly, you can tell someone about it.

## AVIATE – NAVIGATE - COMMUNICATE

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

# Boeing Does First Drone Aerial Refuelling

The MQ-25 demonstration opens the door for some exciting new technology.

Boeing last week accomplished what might be a first, the successful aerial refuelling of a human piloted aircraft—a Navy F/A-18—from its MQ-25 drone prototype. The video is short and totally drama free, which is the way everyone involved wanted it to be.

The initial operational usage might very well be at sea. A carrier-based MQ-25 drone could refuel an F/A-18 (or other platform) without that fighter returning to the carrier to refuel, which is, as you've probably seen, an intense undertaking that takes time. The other option, refuelling from a tanker, is fine, but because the tanker can't be carrier-based, there's the need to rendezvous somewhere else, which sometimes makes great logistical sense but not always. It also gives the F/A-18s greater range and/or payload, since they don't have to tanker fuel.

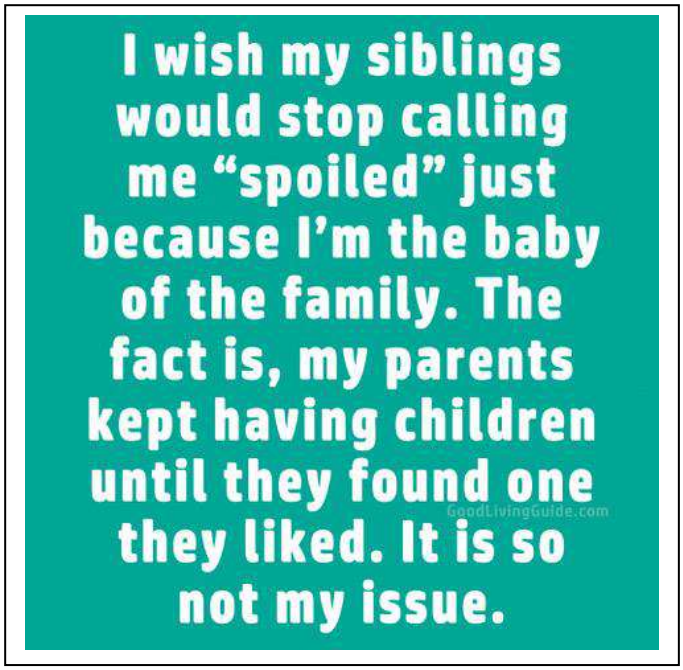
While the June 4, 2021, refuelling was the first of its kind, the opposite arrangement, a crewed plane refuelling a drone, has been done. And, yes, we also assume at some point it will be drones refuelling drones.

In addition to showing the promise of the technology, the test mission also allowed Boeing to gather data on wake interactions, an important factor in refuelling operations. Test engineers will continue to fly refuelling flights in order to expand the envelope and gather data, and carrier testing could happen as soon as later this year

*The MQ-25 drone prototype*

## FLY-INS Looming

| | | |
|---|---|---|
| 08 August 2021 **TBC** | Murgon (Angelfield) (ALA) | Burnett Flyers Breakfast Fly-in |
| 16th – 17TH October 2021 | Brisbane Airshow | Watts Bridge Memorial Airfield |





**A Woman Sends a Text to Her Husband**
**"Honey, don't forget to buy BREAD when you come home from work and your girlfriend Valerie greets you."**
**Husband: Who is Valerie?**
**Wife: Nobody, I just wanted you to answer, to have confirmation that you saw my text.**
**Husband: But I'm with Valerie right now, I thought you saw me?**
**Wife: What??! Where are you?**
**Husband: Near the bakery.**
**Wife: Wait, I'm coming right now!**
**After 5 minutes, his wife sends a message:**
**Wife: I'm at the bakery, where are you?**
**Husband: I'm at work. Now that you're at the bakery , buy the bread !xx** 😎

My wife is blaming me for ruining her Birthday
That's ridiculous, I didn't even know it was her Birthday

# IMPORTANT

## MESSAGE FROM

https://www.brisbaneairshow.com.au/?gclid=EAIaIQobChMIvK_2zKO-8QIV2AorCh3vygAaEAAYASAAEgJpbPD_BwE

## 2021 BRISBANE AIRSHOW POSTPONED

### NEW AIRSHOW DATES: 16TH & 17TH OF OCTOBER 2021

Owing to recent lockdown restrictions beyond our control, it is with deep regret that we must announce that the Brisbane Airshow, due to take place at the Watts Bridge Memorial Airfield over the coming weekend of the 3rd and 4th of July 2021, has been postponed.

Based on these restrictions and our commitment to deliver a safe Airshow, the event has been postponed to the weekend of the 16th and 17th of OCTOBER 2021.

Government imposed COVID lockdown restrictions, designed to reduce the increasing risk of the Delta and Alpha variants of COVID, now prevents key flight crew, Aviation Expo, Display Aircraft, and patrons from attending the show. This directly affects our ability to deliver a safe airshow.

The aggressive nature of the COVID Delta variant and the inevitable disruption to this weekend's event schedule, has moved us to adopt a stance which supports our community's health and our commitment to deliver a quality Airshow.

### PLEASE JOIN FORCES WITH US, POSTPONE AND GET A JAB

COVID requires a collective response. Please 'roll' with us to the 16th and 17th of October 2021 and enjoy one of Australia's finest Airshows, where we will be better placed to deliver a healthier, safer, wider immunised airshow.

## The Orange Black Box

Story supplied by Clive Ryan

You'll be aware of how Australia passed-up the invention of the Century as being ridiculous but this article gives a lot of background that might not be commonly known.

On Friday 19 October, 1934, the passenger plane Miss Hobart fell from the sky to the sea.

Eight men, three women and a baby boy fell with her, swallowed - it's believed - by the waters of the Bass Strait that lies between Tasmania and mainland Australia. The plane's wreckage was never found.

One of those on board was a 33-year-old Anglican missionary, Rev Hubert Warren, who had been travelling to his new parish in Enfield, Sydney. His wife Ellie and four children had stayed behind, intending to follow by boat. The reverend's last present to his eight-year-old son, David, had been a crystal radio set that the boy treasured deeply.

As a boarder at Launceston Boys' Grammar School in Tasmania, David Warren tinkered with the machine after lessons, learning what made it work. He charged friends a penny to listen to cricket matches, and within a few years was selling home-made copies at five shillings each.

Young David was charismatic and a wonderful orator - a boy with star quality. His family, who were deeply religious, dreamed he would become an evangelical preacher.

But that was not to be. The gift from Rev Hubert, Man of God, had launched a love affair with science. It would prove to be of life-saving significance.

By his mid-twenties, David Warren had studied his way to a science degree from the University of Sydney, a diploma in education from Melbourne University and a PhD in chemistry from Imperial College, London. His specialty was rocket science, and he went to work as a researcher for the Aeronautical Research Laboratories (ARL), a part of Australia's Defence Department that focused on planes.

In 1953, the department loaned him to an expert panel trying to solve a costly and distressing mystery: why did the British de Havilland Comet, the world's first commercial jet airliner and the great hope of the new Jet Age, keep crashing? He thought it might be the fuel tanks; but there were dozens of possible causes and nothing but death and debris as evidence. The panel sat down to discuss what they knew. People were rattling on about staff training and pilots' errors, and did a tailfin break off the tail, and all sorts of things that I knew nothing about," Dr Warren recalled more than 50 years later.

I found myself dreaming of something I'd seen the week before at Sydney's first post-war trade fair. And that is - what claimed to be the first pocket recorder, the Miniphon. A German device. There'd been nothing before like it..."

The Miniphon was marketed as a dictation machine for businessmen, who could sit at their desks (or on trains and planes) recording letters that would later be typed up by their secretaries. David, who loved swing music and played the clarinet, only wanted one so he could make bootleg recordings of the jazz musician Woody Herman. However, when one of his fellow scientists suggested the latest doomed Comet might have been hijacked, something clicked for him.

The chances that a recorder had been on board - and survived the fiery wreck - were basically nil. But what if every plane in the sky had a mini recorder in the cockpit? If it was tough enough, accident investigators would never be this confused again, because they'd have audio right up to the moment of the crash. At the very least, they'd know what the pilots had said and heard. The idea fascinated him. Back at ARL, he rushed to tell his boss about it but alas, his superior didn't share his enthusiasm. Dr Warren said he was told: "It's nothing to do with chemistry or fuels. You're a chemist. Give that to the instruments group and get on with blowing up fuel tanks." 'Talk about it and I'll have to sack you'

David knew his idea for a cockpit recorder was a good one. Without official support, there was little he could do about it - but he couldn't get it out of his mind.

When his boss was promoted, David pitched his invention again. His new superior was intrigued, and so was Dr Laurie Coombes, ARL's chief superintendent. They urged him to keep working on it - but discreetly. Since it wasn't a government-approved venture or a war-winning weapon, it couldn't be seen to take up lab time or money.

Dr Warren said the chief superintendent had cautioned him: "If I find you talking to anyone, including me, about this matter, I will have to sack you." It was a sobering thought for a young man with a wife and two children. But his boss's backing extended to sneakily buying one of the precious new dictation recorders, and chalking it up as "an instrument required for the laboratory..."

Encouraged, Dr Warren wrote up his idea in a report, titled "A Device for Assisting Investigation into Aircraft Accidents", and sent it out across the industry.

The pilots' union responded with fury, branding the recorder a snooping device, and insisted "no plane would take off in Australia with Big Brother listening". That was one of his better reviews. Australia's civilian aviation authorities declared it had "no immediate significance", and the air force feared it would "yield more expletives than explanations". Dr Warren was tempted to pack it all in. But his eldest son, Peter, says his father was stubborn, with a non-conformist streak that coloured his whole worldview.

"He took us skiing," he recalls, "but he did the skiing in washing-up gloves, because he wasn't going to pay $30 for a pair of ski gloves. He wasn't the least bit afraid. He wasn't going to wait and follow the herd at all."

It was in that spirit that Dr Warren took to his garage and assembled his 20-year-old radio parts. He'd decided the only way to overcome his critics' mockery and suspicion was to build a solid prototype. It would be the first ever "black box" flight recorder.

Then one day in 1958, when the little flight recorder had been finished and finessed, the lab received an unusual visitor. Dr Coombes, the chief superintendent, was showing round a friend from England. "Dave!" he said, "Tell him what you're doing!”

Dr Warren explained: his world-first prototype used steel wire to store four hours of pilot voices plus instrument readings and automatically erased older records so it was reusable. There was a pause, then the visitor said: "I say Coombes old chap, that's a damn good idea. Put that lad on the next courier, and we'll show it in London."

The courier was a Hastings transport aircraft, making a run to England. You had to know somebody pretty powerful to get a seat on it. Dr Warren wondered who this man was who was giving away tickets round the world to somebody he'd never met.

The answer was Robert Hardingham (later Sir Robert), the secretary of the British Air Registration Board and a former Air Vice-Marshal in the RAF.

In David's words: "He was a hero. And he was a friend of Coombes, and if he gave away a seat, you took it." A few weeks later, Dr Warren was on a plane bound for England - with strict instructions not to tell Australia's Department of Defence what he was really doing there, because "somebody would frown on it".

In a near-unbelievable irony, the plane lost an engine over the Mediterranean. Dr Warren recalled: "I said, 'Chaps, we seem to have lost a donk - does anyone want to go back?' But we'd come from Tunisia and it was about 45 degrees overnight. We didn't want to go back to that hellhole."

They decided they could make it if they ploughed on. He recorded the rest of the flight, thinking that even if he died in that limping transport plane, "at least I'd have proved the bastards wrong!" But unfortunately, we didn't prang - we just landed safely." In England, Dr Warren presented "the ARL Flight Memory Unit" to the Royal Aeronautical Establishment and some commercial instrument-makers.

The Brits loved it. The BBC ran TV and radio programmes examining it, and the British civil aviation authority started work to make the device mandatory in civil aircraft. A Middlesex firm, S Davall and Sons, approached ARL about the production rights, and kicked off manufacturing. Though the device started to be called "the black box", the first ones off the line were orange so they'd be easier to find after a crash - and they remain so today.

Peter Warren believes the name dates from a 1958 interview his father gave the BBC. "Right at the end there was a journalist who referred to this as a 'black box'. It's a generic word from electronics engineering, and the name stuck." In 1960, Australia became the first country to make cockpit voice recorders mandatory, after an unexplained plane crash in Queensland killed 29 people. The ruling came from a judicial inquiry, and took a further three years to become law.

Today, black boxes are fire-proof, ocean-proof and encased in steel. And they are compulsory on every commercial flight.

It's impossible to say how many people owe their lives to data captured in the death throes of a failing plane - to the flaws exposed, and the safety innovations that followed.

David Warren worked at ARL until his retirement in 1983, becoming its principal research scientist. He died on 19 July, 2010, at the age of 85.

For more than 50 years, his pioneering work on the black box went almost unacknowledged. Finally in 1999, he was awarded the Australian Institute of Energy Medal, and then in 2002 was made an Officer of the Order of Australia (AO) for his service to the aviation industry.

Asked why it took so long for him to be recognised, his daughter Jenny observes: "His battle was inertia. He had this huge enquiring mind, scientifically visionary, and could see how it would work - how it would play out. The reply was that he was sitting there in 1958, saying 'this device can make this happen.

Peter Warren blames a 1950s colonial mindset which said nothing good could come out of this country, and everything good would get invented in either the UK, or Germany or America". The historic secrecy surrounding ARL's work, which is now more widely understood, is another likely factor. Dr Warren lived to see Qantas name an Airbus A380 after him in 2008. Jenny Warren says she's been trying to get a seat on it ever since.

But he never saw a penny in royalties from the black box. He was often asked if he felt hard done by. Peter says his standard response was: "Yes, the government got the results of what I did. But then, they also didn't charge me for the other hundred ideas that didn't work."

David's children inherited his sense of humour. At Peter's urging, Dr Warren's death notice included his personal catchphrase: "I'm a lucky bastard." At Jenny's request, he was buried in a casket labelled: "Flight Recorder Inventor: Do Not Open."

Do they think of their dad when flying? His daughter replies simply: "Every time."

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

1. A pilot is on track and is flying a heading of 122° magnetic. If the current wind velocity is 045°Magnetic/25, is the track to the left or right side of the aircraft's nose direction?
   A. Right.
   B. Left.
   C. Neither. If he's on track, it will be beneath the nose.
   D. It could be either left or right of the nose depending on whether the ambient magnetic variation is easterly or westerly.

2. In a gliding turn, in balance and at a constant angle of bank and airspeed, does the inner wing have the same angle of attack as the outer wing?
   A. Yes, the inner wing has the same angle of attack as the outer wing.
   B. No, the inner wing has higher angle of attack.
   C. No, the inner wing has a lower angle of attack than the outer wing
   D. No, the inner wing angle of attack may have a higher or lower depending on wing-tip design.

3. Track drawn on a map that crosses all meridians at the same angle is called what?
   A. A great circle track?
   B. A celestial track?
   C. A graticule track?
   D. A rhumb line track?

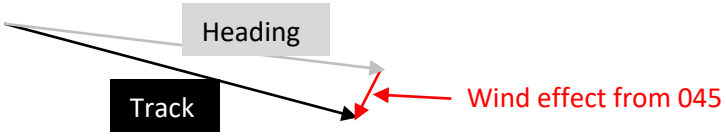
4. Would a forecast cloud cover, listed as BKN at 8000 feet AGL, constitute a ceiling according to Australian MET definitions?
   A. Yes.
   B. No. Ceilings are always expressed as AMSL.
   C. No. Ceilings can only be for OVC and not BKN or lower.
   D. No. Ceilings can only be at heights above 10000 feet.

5. An aeroplane has a flap that is designed to extend rearwards as it is lowered to increase the wing area as well as the camber. This flap is known as …….
   A. A *kruger* flap.
   B. A *zap* flap.
   C. A *Split* flap.
   D. A *Fowler* flap.

See answers and explanations overleaf

If you have any problems with these questions, See Notes below or call me (in the evening) and let's discuss them. Rob Knight: 0400 89 3632 (International +64 7400893632), or email me at kni.rob@bigpond.com.

1. A is correct.




As the nose is aligned along the heading (the gray line), the track lies top the right of it

2. B is correct. Although each wing descends by the same distance, because the inner wing does it over a shorter distance of arc, the angle of descent and thus the angle of attack must be higher.

3. D is correct. It is a rhumb line track.
See https://en.wikipedia.org/wiki/Rhumb_line

4. D is correct.
Ceiling: *The height above the ground or water of the base of the lowest layer of cloud below 20,000 feet covering more than half the sky.* See VFRG Version. 6.3, page 6.4.

5. D is correct. Fowler flap.
See https://en.wikipedia.org/wiki/Flap_(aeronautics)

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# Aircraft Books, Parts, and Tools etc.

## Books

| | | |
|---|---|---|
| Birch & Branson Vol. 1 Basic Flight Training | SOLD | **$65.00** |
| As the Pro Flies (by John Hoyt) | | **$60.00** |
| Fate is the Hunter (by Ernest K Gan) | Pre-owned but very good | **$45.00** |

## Parts and Tools

| Item | Condition | Price |
|---|---|---|
| VDO Volt Readout instrument | Brand New | **$70.00** |
| Toolpro 3/8 drive Torque Wrench | SOLD | **$50.00** |
| Altimeter. Simple – single hand | As new | **$50.00** |
| Oil Pressure indicator, (gauge and sender) | New – still in box | **$80.00** |
| Flight bag. 3 section (2 x zips and 1 x locking flap) | Used but good | **$100.00** |

## Tyres

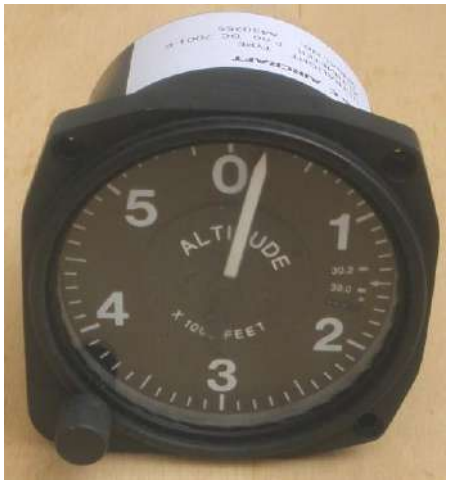
| | | |
|---|---|---|
| 1 only – 13cm X 5.00 – 6 tyre | Unused | **$20.00** |
| 1 only – 13cm 4.00 – 6 tyre | Unused | **$20.00** |

## Headsets

| | | |
|---|---|---|
| AvCom headset. Functions perfectly | Excellent | **$150.00** |

Contact Rob Knight via either kni.rob@bigpond.com, or **0400 89 3632**.

# Altimeter for Sale




This simple altimeter I purchased at Oshkosh is now surplus to my requirements and I am seeking a new home for it.

Its face is absolutely clear, it has never been used, and the subscale is provided in "HG.

It is in as-new condition and certificated. For a copy of the certificate, and/or further details, contact

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

Mob: **0419 758 125**

**$120.00**

# Aircraft for Sale

**¾ scale replica Spitfire**

**$55,000 neg**

This aircraft is airworthy, flown regularly, and always hangared. Registered 19-1993, it is powered by a 6-cylinder Jabiru engine (number 33a-23) with 300 hours TTIS. The airframe has logged a mere 320 hours TTIS. This delightful aircraft has recently been fitted with new mounting rubber, a new alternator and regulator, a new fuel pump, and jack stands

It handles superbly and is available for immediate collection or delivery by arrangement.

Kept at Kentville in the Lockyer Valley, interested parties should contact either:

Kev Walters on Tel. **0488540011** or

William Watson on Tel., **0447 186 336**

# Aircraft for Sale

**$ Make Me an Offer$**

## Cobham Cobra

An opportunity to buy a unique aircraft.

I now have a Foxbat, and can't to afford to keep 2 aircraft. The Cobra was advertised for about a year in Sport Pilot, with many enquiries, but no resulting sale. Rather than continuing to spend on hangarage and advertising I decided to de-register it, remove the wings, and trailer it home to my shed. I don't intend to ever fly it again so, make me an offer. It provides very cheap and enjoyable flying.

It is a one-off design, a single seater with a fully enclosed cockpit. It has a 24-foot wing-span, and is powered by a VW engine that provides sporty performance and superb handling. The airframe has logged 653 hours and the engine 553 since installation. It is easy to start, but requires hand-propping.

To see it in action, go to
https://www.youtube.com/watch?v=V5Qx4csNw_A&list=PLpBv2A6hk66Tg9DiCsjEtt4o4o8ygcTju&index=1&t=22s

It cruises at around 80 knots at 11-12 litres/hr. The tanks hold 48 litres so it has a very reasonable range. For my approaches I use 50 knots on my initial approach down to 40 knots on short final. You will want a fair bit of tailwheel time.

For further details contact Tony Meggs on (02) 66891009 or tonymeggs@fastmail.fm

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## Slipstream Genesis for Sale **$14,000.00**

Imported and built 2001. Two seats side by side, powered by 80 hp 912UL Rotax, driving a Warp Drive 3 bladed prop. Cruise 70-75 knots. Empty weight 304kg, MTOW 544 kg, Payload 240 kg. Fuel tanks hold 78 litres. With fuel burn averaging 16 litres/hr, still air endurance (nil reserve) is theoretically 5 hours, or 350 nm. Aircraft always hangared. It has been set up for stock control/ mustering or photography, and is not fitted with doors. Registered until 13 October 2021, currently flying, and ready to fly away.

Total Hours Airframe: 144.6. Current, up-to-date, logbook.

Total Hours Engine: 1673.9. Annuals/100 hourly inspection done 01/09/20. Sprag clutch replaced January 2020, gearbox overhauled January 2020.Just undergone ignition system overhaul. One CDI Ignition unit replaced PLUS brand-new spare unit included in sale. Easy aircraft to maintain - everything is in the open. Comes with spare main undercarriage legs, spare main wheel, and nosewheel with other assorted spare parts included.

Fabric good, seats are good, interior is tidy. Fitted with XCOM radio/intercom. Basic VFR panel with appropriate engine instruments, and compass.

An article on this aircraft was published in Sport Pilot, June 2019 issue. See front cover and pilot report within.

Must sell: two aeroplanes are one too many. Quick sale - Fly it away for $14,000.

Contact **Rob Knight tel. 0400 89 3632**, **or email** kni.rob@bigpond.com for details and POH.

# Aircraft Engine for Sale

ROTAX 582 motor. Ex flying school, TTIS 600 hours, and running faultlessly when removed from aircraft for compulsory replacement.

No gearbox, but one may be negotiated by separate sale if required.

Interested parties should call…..

Kev Walters on Tel. **0488540011**

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