# BRISBANE VALLEY FLYER

## April 2023

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

**Rob Knight (Editor) Tel: 0400 89 3632, Email kni.rob@bigpond.com**

The **Aero-Works Aerolite 103,** now gone EV – See next month.


| | | | |
|---|---|---|---|
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| John Innes (Vice Pres.) | 0417 643610 | Acting Secretary | 0418 159 429 |

# Contents

Greetings members,

During the month of February our BVSAC members have helped out with the Vetta grass cut. This was a great effort by the club as we had 7 members help out over the 2 days.

Our last meeting was very well attended and all had a great day and a good lunch.

Our members also helped out at the Watts for breakfast with 4 members in attendance, so it cannot be said that our club does not help out.

After Watts for breakfast, the BOM held a talkfest on how to raise funds and there was a lot of good ideas were put to the board. Members from BVSAC executive attended this meeting.

The information gained from this meeting will be look at by the BOM to see if a program can be worked to make it happen.

Out next meeting will be held on April 2. Please come along for a good day fun and friendship.

Best wishes

Peter Ratcliffe
President BVSAC

## Slip and Crab. What's the Difference?

By Rob Knight

The piece that I published regarding slipping and skidding in last Month's Flyer, has prompted questions of differentiating between a slip or skid condition versus a crab condition. Aircraft inevitably do both so it's a good question.

To start with, let's get defined exactly what we are discussing.

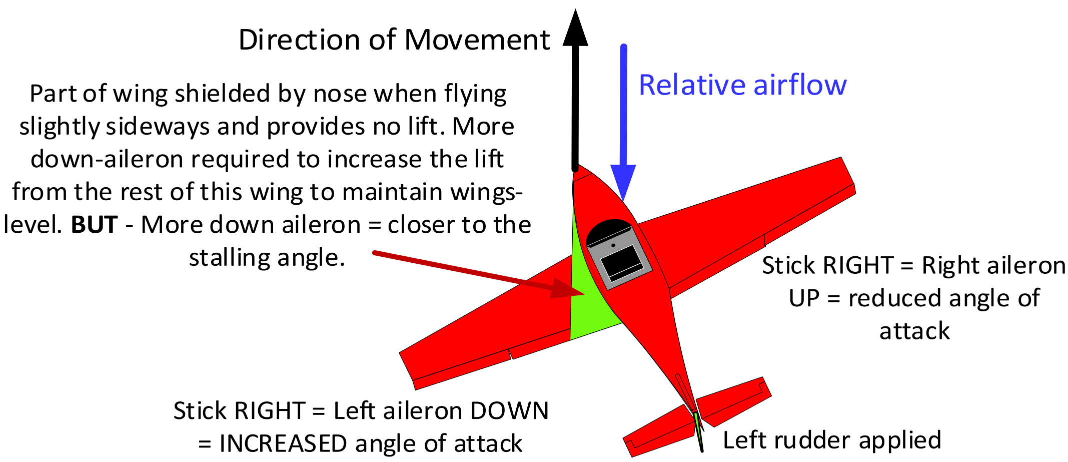
Slip and skid are aerodynamic conditions where the aeroplane moves sideways relative to the airflow around it so its nose isn't pointing directly into the airflow relevant to that aeroplane.

A crab is a condition where the aeroplane moves sideways across the earth's surface below and doesn't cross the surface in the direction its nose is pointing.

In other words, Slip and skid relate to the airflow immediately adjacent to, and in contact with. the aeroplane, whilst crab is relative only to the distant ground below and has no aeroplane contact.

As I mentioned last month, slip is as easy as applying bank with the ailerons and holding top wing rudder to prevent or reduce the rate of nose movement around then horizon. With the controls in this "crossed-controls" condition, the aeroplane will be banked but the excess rudder towards the top or higher wing in the banked state, will cause the rate of turn to be lower than the current angle of bank requires. The result will be that the aeroplane "slips" inwards, towards the lower (or inner) wing. Therefore, if left aileron is held to provide left bank, and simultaneous right rudder is held to restrain the rate of turn (or prohibit it completely), the aeroplane will slip to the left, towards the angle of bank.

The reverse applies when bottom rudder is held when banked. Take again the situation of left bank, but now applying and holding left rudder, the aeroplane will skid OUTWARDS, away from the turn. In this case the rate of turn is excessive for the bank angle applied and the aeroplane responds by changing direction faster than the bank would dictate. This skid manoeuvre is surprisingly hard to achieve and is definitely not a natural condition of flight, which your own body sensors will quickly confirm. Taken to an extreme, severe skidding in level flight in many aircraft designs will result in a "snap", a sudden and vicious roll caused by one wing stalling unexpectedly and savagely.




*One wing is always partly shielded in slip or skid*

Summary:

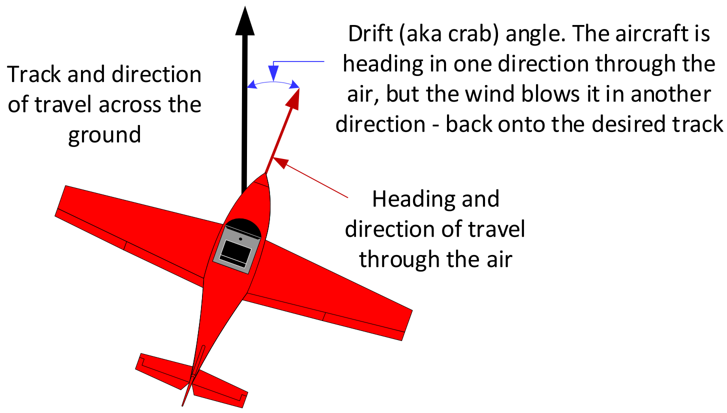
- Left rudder pressed and held, stick pressed to the right to give left aileron down, and right aileron up to maintain wings level.
- Part of left wing shielded to the airflow so generates no lift, effectively making this wing smaller insofar as lift generation is concerned. Additional down-aileron required to increase lift from remaining wing area to maintain wings level.
- Aerofoil section with down aileron has higher angle of attack so will reach the stalling angle of attack earlier – with a much lower than normal nose attitude.
- The stall thus provoked will be outboard, in front of the aileron, at the wing's tip, so any normally-benign stall characteristics of the aircraft will dramatically transform to something far more unpredictable and malicious.
- If stall occurs, the left wing will, without warning, abruptly stall and the aircraft will roll savagely left. Simultaneously, yaw from the added drag on the stalled left wing will pull the nose further left and pitch it down. This is autorotation, and, if unchecked, becomes a spin.

Note that the wing drop and autorotation will be towards the applied rudder - in this case wing drop and roll to the left.

*This crossed controls issue caused a fatal crash in a CT4 Airforce trainer during a demonstration flight. During a fly-past at low level, the pilot was applying savage inputs of rudder, observers stated later that it appeared to be full applications of the control, whilst maintaining as near to wings level as he could achieve. The port wing stalled, the aircraft snap-rolled left, and dived semi-inverted into the ground adjacent to the observers. No observers were injured but the inquiry determined that the accident was pilot induced and unsurvivable for him.*

The point that I am ensuring is made here is that the aeroplane is not flying with the approaching airstream directly head on: instead, the aeroplane is flying slightly sideways and the issues that I depict are caused solely by either slip or skid inherent in this action.

Crabbing, on the other hand, is a condition where the aeroplane is flying to some degree sideways across the ground. Crabbing has nothing whatsoever to do with whether the aeroplane is flying straight or sideways according to the air in which it's flying.




*Crabbing, in itself, has no slip or skid associated with it - the balance ball is only influenced by slip or skid.*

Crabbing is the result of flying the aeroplane towards a fixed or specific point on the ground when there is a crosswind component, the wind is not blowing the aircraft either directly towards or away from that point, or, to put it more succinctly, when there is no cross wind. The aeroplane, in order to make a direct track to the required and selected point, will need to crab to correct for the drift that the wind is causing.

However, when tracking to compensate for drift, the aeroplane is moving through the air straight ahead, and it is the movement of the air mass in which the aeroplane is operating that is carrying the aircraft sideways and/or changing its speed across the ground. Movement of the airmass in which the aircraft is flying will modify both the direction in which the aircraft actually proceeds and at what ground speed.

This is no different to a swimmer swimming across a river. The current will cause him to drift so he will have a crab angle. To swim to a selected point on the far bank, he will need to crab to allow for this drift.

Whilst crabbing holds no inherent danger to any aeroplane, slip and skid can impose aeroplane flight-characteristic changes on an unsuspecting pilot. Operationally, skid, perhaps, holds the greatest danger because that is often performed in level flight whereas slips are associated with a descent when the stall speed is reduced a little and less likely to be encountered. Also, pilots are (or should be) more airspeed-aware on approach so less likely to be surprised.

Even so, properly handled, there is no danger to an aeroplane or people provided extreme skid is not performed, or, if it is desired and performed, to ensure you have the required 3000 feet of safe air beneath your aeroplane.

The secret phrase is, “properly handled”. If you can’t handle it properly, better get some help before you try it! Remember – it’s no good wishing you’d got some help when you are forced to accept that you really need it RIGHT BLOODY NOW!

Happy Flying

***"Life is short.***

***Drink the good wine first."***


ITV News
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⚠ BREAKING ⚠

British man killed by shark whilst honeymooning in Australia. Reports say he didn't suffer for too long as he'd only been married 5 days.


A dyslexic man walked into a bra

Deja Moo: The feeling that I've heard this bull before

I went to a seafood disco last week.... And pulled a mussel

We were all born ignorant, but one must work hard to remain stupid.

Benjamin Franklin

## Cessna 180 vs 185 (Similarities & Key Differences)

Aircraft comparison

*Cessna 180*

*Cessna 185*

The Cessna 180 and 185 are both classic airplanes that share far more in common with each other than they differ.

This is for good reason, considering that the Cessna 185 was developed from the 180.

Both planes have a history of use in civil and military aviation, with both being widely used in bush flying, and for the commercial transport of passengers and freight.

Today, they are popular with both air charter companies and private individual owners.

Let's take a closer look at each plane, as well as the key differences between the two.

### Cessna 180

Overview

- **Role:** Light utility aircraft
- **Manufacturer:** Cessna
- **First Flight:** May 26, 1952
- **Introduction:** 1953
- **Produced:** 1953–1981
- **Number built:** 6,193

Specifications

- **Take-off Run:** 625 ft
- **Take-off Run over 50 ft Barrier:** 1,205 ft
- **Rate of Climb:** 1,100 ft per min
- **Service Ceiling:** 17,700 ft
- **Top Speed:** 148 knots
- **Cruising Speed (75% power):** 141 knots
- **Cruising Range (75% power):** 725 nautical miles
- **Cruising Range (maximum):** 890 nautical miles
- **Stalling Speed:** 48 knots
- **Landing Roll:** 480 ft
- **Gross Weight:** 2,800 lbs
- **Empty Weight (standard):** 1,648 lbs
- **Useful Load:** 1,152 lbs

Variants

- **180A, 180B, 180C, 180D, 180E, 180F, 180G, 180H, 180J, 180K**

  Note: No "I" model was ever produced.

## Cessna 185

Overview

- **Role: Light utility aircraft**
- **Manufacturer: Cessna Aircraft Company**
- **First Flight: July 1960**
- **Introduction: 1961**
- **Produced: 1961-1985**
- **Number built: Over 4,400**

Specifications

- **Take-off Run: 770 ft**
- **Take-off Run over 50 ft Barrier: 1,365 ft**
- **Rate of Climb: 1,250 ft per min**
- **Service Ceiling: 17,150 ft**
- **Top Speed: 155 knots**
- **Cruising Speed (75% power): 145 knots**
- **Cruising Range (75% power): 585 nautical miles**
- **Cruising Range (maximum): 720 nautical miles**
- **Stalling Speed: 49 knots**
- **Landing Roll: 480 ft**
- **Gross Weight: 3,350 lbs**
- **Empty Weight (standard): 1,687 lbs**
- **Useful Load: 1,663 lbs**

Variants

Civil:

- **185A Skywagon**
- **185B Skywagon**
- **185C Skywagon**
- **185D Skywagon**
- **185E Skywagon**
- **A185E Skywagon and AgCarryall**
- **A185F Skywagon and AgCarryall**

Note: The AgCarryall option was an agricultural aircraft that featured an external 151-gallon chemical tank, removable spray booms with 30 nozzles, wind-driven spray system, windshield wire cutters, and vertical stabilizer cable deflector

Military:

- **U-17A: Military version of the 185E, equipped with a 260hp Continental IO-470-F piston engine**
- **U-17B: Military version of the A185E, equipped with a 300hp Continental IO-520-D piston engine**
- **U-17C: Four seats, powered by a Continental IO-470-L piston engine**

## Cessna 180 vs 185 Key Differences

The Cessna 180 and 185 both share the same fuselage, control surfaces, wings, horizontal stabilizer, and main landing gear.

However, there are also a few key differences between them.

**ENGINE:** The main difference between the Cessna 180 and 185 is engine power.

- The Cessna 180 has a carburetted Continental 0-470-U engine rated at 230 horsepower.
- The Cessna 185 has a fuel-injected Continental IO-520-D engine rated at 260 horsepower.
- The 185 engine also has a maximum continuous horsepower rating of 285, with 300hp allowable for five minutes at take-off.

**FUEL BURN:** Due to its smaller engine, the Cessna 180 is the right choice when it comes to more efficient fuel-burn.

- It, therefore, has a better range than the 185 (890nm vs. 720 nm).
- This is ideal in more remote areas where there is a lack of refuelling facilities, or you are otherwise unable to refuel.
- The Cessna 180 burns 3-4 fewer gallons an hour, making it the more economical choice.

**POWER:** The Cessna 185 is the more powerful of the two, making it more suitable when a pilot needs to operate on wheel-skis or floats due to its much better take-off and load-carrying performance.

**CONTROLS:** The Cessna 180 is lighter on the controls than the 185.

- Due to its lighter gross weight and thanks to its larger tires, the 180 is better at getting in and out of very short runways.
- However, both the 180 and 185 can make crosswind landings on wheels a bit of a challenge.

**HOW MUCH DOES A CESSNA 180 AND CESSNA 185 COST TODAY?**

That’s a very good question. In today’s volatile market as at 03/03/23, it’s likely that, if you want to buy a Cessna 180, you’re looking at a minimum price of AUD$162,000 (1955 model) to AUD$590,000 (for a 1977 model). For a Cessna 185, expect to pay a minimum of AUD$237,000 (1966 model) to AUD$891,000 for a 1980 185F.

Of course, condition, whether the plane is on floats, with floats, skis, or just wheels has been used, abused, or refurbished, etc. will all reflect greatly in the price.

See https://executiveflyers.com/cessna-180-vs-185/

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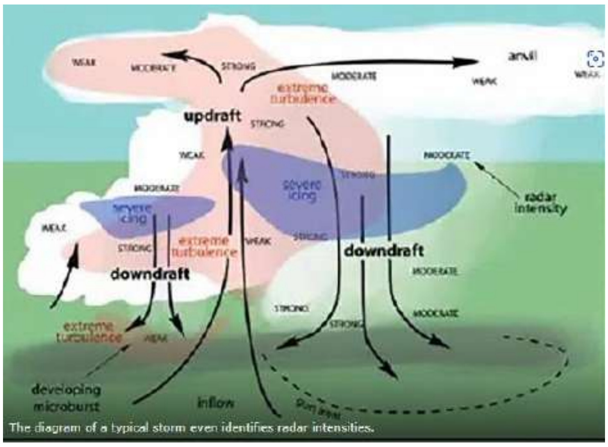
## The Severe Storm

By Tim Vasquez. Published in AVwebFlash :March 6, 2023.



The diagram of a typical storm even identifies radar intensities.

Little raises dread in a pilot more than a severe storm, and for good reason. But assume your analytical persona for a moment and we'll make short work of ‘em.

Strong thunderstorms are one of the places aviation and fear often intersect. And for good reason: severe storms have led to countless disasters, perhaps the most famous one being the Delta L-1011 crash at DFW Airport in 1985. That tragedy brought far-reaching consequences to flight training programs and ATC equipment, and led to advances in the field of meteorology.

You can read a lot about thunderstorms online and see all sorts of storm video and tornado footage on YouTube, but in this article, I’ll draw on my experience as a flight forecaster, my radar and forecast training, and my decade-long foray into storm chasing, which gave me a look at things under the hood. I’ve distilled here some of the most useful fundamentals that are useful to pilots. Hopefully you’ll come away with a more detailed knowledge of what you’re up against when things are looking rough out there.

### Convection

Thunderstorms are a convective-driven process. By convection, we mean kinetic motion that occurs due to buoyancy. The buoyancy, in turn, is caused by warm air from the lower levels of the atmosphere that rises into relatively cold temperatures aloft. The greater the difference between low-level temperatures and upper-level temperatures, the greater the instability, and the more likely that a buoyant parcel of air will rise rapidly. The velocity of these rising parcels, by the way, is directly correlated to in-cloud turbulence and severe weather. So instability figures alone do directly correlate with bumps and problems in the cockpit.

You might now be picturing a boiling cumulonimbus cloud. But I haven’t yet said anything about moisture. In an unstable environment with rising parcels, we could very well be talking about Phoenix or Riyadh in July under blue skies.

But clearly, we do need moisture to get storms. The more moisture that exists in terms of unit mass, the better—for the storm. The best measure for this is dewpoint, mixing ratio, or specific humidity, especially at the surface or in the lowest kilometre of the atmosphere. Dewpoint works perfectly fine for this purpose, and it’s available on the ATIS broadcast. Higher dewpoint favours thunderstorms and severe weather. But this doesn’t always work.

Warm mid-tropospheric conditions are usually what shuts down any storms when it’s sultry outside. This explains the so-called “horse latitudes,” in subtropical regions, where warm moist air lingers for months but the rain never comes. And that’s because of warm middle and upper tropospheric conditions caused by the subtropical ridge. No wonder the deserts of Australia, northern Africa, and the Middle East are so dry.

You might already be thinking that if we could just compare the low-level temperatures to the upper-level temperatures, and compare the dewpoints, we could work up some sort of rule of thumb for predicting storms. The K Index and Totals Index do this very thing, and were popular in the 1960s and 1970s. Refinements known as Showalter Stability Index and Lifted Index had the same idea. However, all of these just look at single levels in the atmosphere, meaning important details can be easily missed. Those techniques are now considered antiquated and not very accurate.

Around 2000, the meteorological community embraced a quantity called CAPE (convective availability of potential energy), expressed in joules per kilogram. CAPE does the same sort of thing by looking at temperature differences and factoring in dewpoint, but it integrates all levels in the atmosphere and gives a more realistic picture of instability. It's probably the single best predictor of storm potential. You can find CAPE on many products across the Internet. Values of above zero indicate instability exists in the atmosphere, with values over 400-500 supporting storms, and those over 1000-1500 supporting severe weather.

However, you must be careful how it's used. For example, many atmospheric soundings found on the Internet show you CAPE numbers, but these soundings are valid only at the radiosonde launch time, which is 0000 and 1200 UTC at most locations. They don't factor in changes like diurnal heating and moisture advection that could affect the environment during the day. For those you must either get an updated sounding or use a model forecast sounding. The Storm Prediction Center mesoanalysis graphics at www.spc.noaa.gov/exper/mesoanalysis are better for beginners and will give you easy-to-read maps of current estimated CAPE numbers, as well as forecast CAPE out to 6 hours in the future.

**Storm Structure**

Now let's take a look at the storm itself. The rising *updraft* is caused by sensible heat and latent heat interacting with the instability in the atmosphere and producing large masses of buoyant air. It's fed from below by *inflow*, made up of warm moist air. It rises in the updraft, condenses, and produces cumuliform cloud material, giving us the familiar cumulonimbus towers. Eventually precipitation is formed: a mix of ice crystals, droplets, and graupel.

The air at the top of the updraft eventually reaches an *equilibrium level*, where it encounters the tropopause or layers of relatively warm air. At this point the updraft spreads into a vast *anvil cloud* made up of ice crystals. Some of it is carried hundreds of miles downstream.

But the precipitation begins falling, and entraining the surrounding air. This leads to the development of a *downdraft*. Many downdrafts are weak, but relatively dry air surrounding the mid-levels of storm can help accelerate the downdraft and lead to downburst and microburst production. Low dewpoints and low relative humidity in the middle troposphere, in a band between 10,000 and 25,000 feet MSL, are a prime contributor to these dangerous events. A special kind of CAPE expression called DCAPE (downdraft CAPE) is extremely helpful for identifying these environments. Values over 1000 strongly correlate with downbursts and microbursts.

Once the downdraft reaches the ground, it spreads horizontally in the form of *outflow*. This in turn can produce a large, menacing arcus cloud, and spread away many miles as an *outflow boundary*. If the outflow boundary is strong and gets more than several miles from the storm, the storm itself normally begins weakening and dissipating, but new storm development can take place along the outflow boundary.

#### SHEAR

Perhaps you've wondered why the tropics have such massive storms, yet tornadoes are almost unheard of in those regions. The reason for this is these tropical areas usually lack vertical shear and helicity.

A dark rain-free base, representing a well-developed updraft, is undercut by dust and outflow.

Vertical shear is simply the change in the wind vector per unit of height. Naturally, strong winds with large directional changes are most effective at providing vertical shear. In the tropics, pressure gradients on a day-to-day basis are simply not strong enough to produce strong, sustained winds through deep layers.

Forecasters most commonly look at the difference between low-level and upper-level winds to give a spot estimate of shear. This is known as bulk shear. The 0-6 km (0 to 20,000 feet) shear is often seen in publications and scientific papers, and is simply the wind vector difference between those two levels in meters per second or knots. To a certain extent you can even eyeball it looking at winds aloft charts. Bulk shear is one of the best discriminators of severe storms, and values that exceed 30 knots favour organized storms like supercells and bow echoes. Perhaps now you're seeing why jet streams and severe weather have something in common.

Then there's helicity. This measures both the shear *and* the directional change of the winds through a vertical layer. Here, the lowest one or two km is by far the most important layer. This represents the layer that becomes ingested into a storm updraft. Helicity leads to a tendency for a corkscrewing motion of the air.

Imagine that you lay a pencil in your hand, pointed away from you to represent the mean wind vector. You move your lower hand slowly away from you and push your upper hand rapidly away, repressing the differing wind flow at two levels. This is shear with no helicity or directional change. The pencil does not rotate, because the shear is parallel with the pencil. But if you push your lower hand away and to the left, and push your upper hand away and toward the right, the pencil rotates between your hands, simulating the corkscrewing tendency of this air.

If this layer is tilted into the vertical by the updraft, the helicity is converted to vertical vorticity. This shapes the distribution of mass in the storm in a way that creates mesocyclones and tornadoes. Exactly how that happens is still not well understood and you'll have to dig around in meteorology journals. But this helicity helps the storm become steady-state, adding to its persistence. All of this helps create the supercell thunderstorm. Shear and helicity translate to supercells and tornadoes. And you don't need much instability to make it happen. Tornado warnings during hurricanes are a good example.

#### THUNDERSTORM FEATURES

Now that we've gotten past the boring fundamentals, let's examine the storm the way you see it from the cockpit: in terms of visual features. The cumuliform tower itself is a manifestation of the updraft, and on its bottom side is a so-called *rain-free base*. A broad, dark rain free base signals the presence of a large updraft and the potential for further storm organization. A mushy, ragged updraft base indicates a weak updraft, and sometimes the rain-free base paradoxically fills up with rain, becoming fuzzy, and telling you that the updraft has just given up.

If you're at a distance from the storm, you can examine how hard the tops of the cumulonimbus towers look. Rock hard, cauliflower-like towers suggest the updraft is rising rapidly in an unstable environment. Knuckle-like textures near the interface with the anvil, and overshooting tops punching a few thousand feet above the anvil are also signs of a strong storm. On the other hand, mushy towers with soft tops suggest a weak storm.

The *precipitation core* is another important part of the storm, and takes on a diffuse, foggy, whitish appearance. Sometimes the boundary between the updraft and the precipitation shaft is unclear, but they do represent two different processes. The precipitation shaft is made up of a mix of falling rain, hail, and graupel, and it tends to be embedded in the downdraft. This is what you see on radar, not the updraft or the cumulonimbus towers.

Pay close attention to wind direction. Is it flowing towards or away from the precipitation core? This determines whether you're getting outflow or inflow. Which one is happening directly underneath the rain-free base (the updraft) tells a lot about whether the storm is outflow dominant or not. If winds under the rain-free base seem to indicate extensive outflow, there's a possibility the storm is being undercut and will either weaken, dissipate, or redevelop (propagate) further downwind.

And look at the ground all around the storm. Sometimes you can see dust whirls or dusty plumes, indicating the presence of strong winds. This can help show where the outflow is, but in rare instances it's the result of strong inflow, especially in severe weather episodes in the Great Plains. Tracking the movement will help give some idea of what you're looking at.

These mammatus clouds developed underneath a strong anvil in Oklahoma in April 2011.

Often you will see mammatus, which are rounded bumps on the underside of the anvil cloud that look like udders. Flight training material from the 1970s used to refer to this as a sign of tornadoes and severe weather, but this is now known to be a myth. Mammatus does tend to correlate with well-developed thunderstorms producing large amounts of ice crystals and probably an environment with moderate shear, but it sometimes also develops in benign weather conditions. Enjoy the view and take a few pictures if you can.

Prolific lightning is an excellent indicator of a severe storm.

Then there's lightning activity. Yes, if you have a Strikefinder you can use that too. Lightning frequency definitely correlates with storm strength. A distinct sign of strong storms are "anvil crawlers," which are horizontal lightning discharges that appear as fingers reaching outward or which snake through the anvil for many miles. I've always associated these with hailstorms, and they're common in tornadic storms. I'm not sure I've ever observed these with a non-severe storm.

**FORECASTING THE STORMS**

Storm forecasting is complex, and probably a bit too specialized for the general aviation community. But I've introduced you to the essentials: instability, shear, and helicity are the key things we rely on. Quite often when I forecast, I'm keeping it simple and just focusing on CAPE and a few shear values. Tracking boundaries, fronts, and changes in the atmosphere and using the most of satellite, radar, and surface plots is perhaps 80 percent of the work. We use forecast models surprisingly very little when forecast time scales are minutes to a few hours away. They just don't work well.

One source you should get to know is SPC, the Storm Prediction Center (www.spc.noaa.gov). The convective outlooks are the best products there are for finding hazardous thunderstorms, and I would argue that SPC employs the best storm forecasters in the country. When you are down to the one- to two-hour time frame, start checking the Mesoscale Discussions tab. This outlines areas of concern before most watch boxes are issued, and they contain a convenient map and discussion.

And check close-up visible satellite images and radar regularly. As you get used to working with these products, you'll become accustomed to how a storm situation looks and will soon be able to spot important features. Definitely continue to use your authorized briefing sources, but having a few bookmarks on hand will help fill in some of the unknowns and provide you a greater depth of situational awareness on your next flight.

*This article originally appeared in the March 2022 issue of IFR magazine.*

*For more great content like this, subscribe to IFR!*

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## Mate! Be Aware.

By Rob Knight

Recently, on a leisurely Sunday afternoon social call to a friend at a satellite airfield in the Lockyer Valley, I saw a light aircraft appear close to the airfield at a little below circuit height, and flying against the flow of established traffic. To add to the dangers, the pilot made no call on the required frequency.

The aircraft ahead of me took off after the aircraft had passed his position and departed safely. I waited until the intruding aircraft had done another orbit, and I saw that our paths could not cross and I departed myself.

Fortunately, this type of occurrence is relatively rare, although even a single example could result in a serious accident and multiple deaths. I believe that it was probably the result of a pilot being unaware of the fact that he/she was flying through a circuit pattern with aircraft in it.

However, it is/was their responsibility to know this. Being unaware of such a situation is not an excuse.

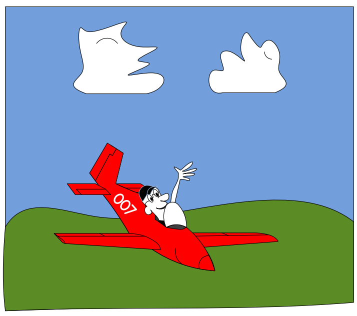
Not only is a pilot required to ensure that he/she is legally able to fly as a pilot-in-command with medicals, ratings, endorsements and recent experience requirements to meet, as well as aircraft airworthiness and maintenance items to check, on top of met conditions and passenger safety, BUT also to make sure that their lack of situational awareness doesn't let them wander into danger as this aircraft did.

Not only was the aircraft's safety compromised, but so was every-one else's in the area who were operating at that time.

When we fly, we obviously have as responsibility to ourselves and to the passengers in the aircraft that we are piloting. It is our legal duty to ensure that the flight is carried out in all respects within the law and our ability. This is the reason for flying training – to ensure that all pilots are aware of the issues, the need, and the requirements for flight safety, and the ability to carry out a flight in safety.

It is the absolute right of all other air users that every pilot acting as the pilot in command must comply with all legal and, hopefully, moral requirements.

Happy Flying



## FLY-IN Invites Looming

| WHERE | EVENT | WHEN |
|---|---|---|
| Murgon (Angelfield) (YMRG) | Burnett Flyers Breakfast Fly-in | **Find Next Planned EVENT Sunday 11 June. Confirm details at: http://www.burnettflyers.org/?p=508** |

## Proposed Fly-Ins

Two flying safaris are currently being proposed, one towards the desert from Brisbane, and the other north, along the Coral Sea coast to a river.

*Dawn over the Dam - Charlotte Plains*

A group trip to Charlotte Plains (remember it was being planned during Covid – well that and the mouse plague caused that to be deferred). The proposal has been reopened and discussions are underway to collect details (of fees and other costs) which can then be relayed to those interested.

*In Hot Water - Bore drain swim –*

Charlotte Plains is a most photogenic sheep station parked 25nm east of Cunnamulla township. Catering for farm stayers, it also boasts a 900 metre plus dirt runway, uncharted, but designated as YCHA, and hot swims in the bore drains. The colours of the landscape and flora are stupendous, and a delight to any photographer, budding or otherwise. Accommodation is tent-under-the wing, or something more substantial by arrangement. MOGAS may be available by arrangement.

The other proposed trip is a suggested weekend (or more if you wish) trip to Baffle Creek Retreat, about 30nm NNW Bundaberg. It has a charted airstrip (designated OZBKR) which has an elevation of "0" as it's right on Baffle Creek. Its runway (13/30) has a stated length of 710 metres of grass and gravel.


*Google Earth screen grab of Baffle Creek area and strip*

The idea is to either fly in for their muster weekend on 14/15 July, or select another date for a fishing weekend.

Take your own fishing rods, and fuel is available at the local servo. If successful, this would make a good annual trip with a fishing competition to boot.

Current details and information on both these trips can be obtained from Rob Knight. Call **0400 89 3632**, or email: *kni.rob@bigpond.com.*

## Obituary -

*Werner Leist*, 94, a friend to many in the Watts Bridge and Lockyer Valley areas, passed away at his home on the Tuesday, 14th March 2023.

Well known in this area in the light aviation arena, Werner helped many home-builders with their projects. In my case he assisted me most ably in the build and early flying of my Skyranger Swift, 19-8082.

His involvement in aviation goes back to WW2 in Germany where, initially flying gliders, he then training as a fighter pilot in the Luftwaffe. His advanced training saw him converting to the Messerschmitt ME262 but fortunately the war ended before he saw combat.

*Werner, at Watts, working on the parts for 8082, my Skyranger (Image – Mal McKenzie)*

Post WW2, c.1955, he moved to South Africa and was employed as an architect but his involvement with aviation continued as a civil pilot. He purchased and flew several aircraft including DH82 Tiger Moths, a Cessna 170, an Auster 6 (also known as a K Model Auster), plus others. One of his DH82s he restored from surplus WW2 stores, plus helped others to restore a Spitfire which is now in a now in a South American museum.

In Australia, it can be said that Werner flew as an enthusiastic and involved passenger and over the years often visited Watts Bridge and Murgon. He also provided help with the building and assembly of several other local aircraft, apart from my Swift. He was a frequent passenger in 8082 and the other light aircraft that he assisted in mnufacturing.

Goodbye, my friend. I am filled with the great memories that we shared.

Mal McKenzie

## The Strange Supersonic Aircraft That Never Reached Its Full Potential

By ATHER FAWAZ. Published March 5, 2023

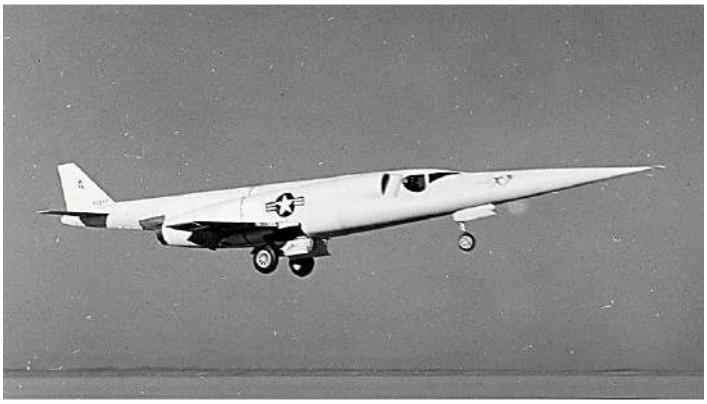

The Douglas X-3 Stiletto was a sleek experimental aircraft built to explore new aerodynamic designs and technologies for sustained supersonic flight. The X-3 project took birth in the late 1940s and spanned into the '50s, an era when the jet engine grew as a viable propulsion system for military aircraft. Compared to rocket-powered flights, jet engines provided a cheaper, safer, and more accessible method of propulsion. But pioneering jet-propelled aircraft like the F-86 Sabre and MiG-15 had one big limitation — they could only break the elusive sound barrier (Mach 1) in a dive. Hence, the next milestone in aviation was to build an aircraft that could take off from the ground, climb to a high altitude, reach and sustain twice the speed of sound (Mach 2.0), and land back safely, all under its own power. This ambitious goal led to the birth of the Douglas X-3 Stiletto, the construction of which was approved in the summer of 1949.

*A bold design to match the ambitious targets*

Built by the Douglas Aircraft Company, the X-3 Stiletto had an unorthodox, almost futuristic design. Maj. Charles E. Yeager, the first pilot to break the sound barrier, was in the inspection team for the aircraft and influenced its design. The X-3 had short, stubbed wings and a long nose, making the overall structure mimic a stiletto heel. A pressurized cockpit was embedded inside its slender fuselage, offering a limited view to the pilot who sat in a reclined, downward ejecting seat, which doubled as an electronically controlled lift.

The X-3 was also the first aircraft to use titanium in its construction in a bid to explore the viability of the element in airframes. Also nestled in the cramped fuselage were the two Westinghouse J34 turbojets powering the X-3 toward its ambitious goals. These J34s were actually underpowered substitutes when the originally planned higher-thrust J36s failed to meet the program's demands and timelines.

Despite initial hiccups, the Douglas X-3 made its first official flight on October 20, 1952. But the limitations of the aircraft surfaced shortly thereafter. Testing showed that the X-3 was severely underpowered. The substitute J34 engines could not power its sleek design. Its first supersonic flight clocked Mach 1.1 but was made possible only after it made a 15-degree dive, according to NASA. In its fastest flight, the X-3 could only manage Mach 1.208, that too on a 30-degree dive. Moreover, the aircraft had a take-off speed of nearly 260 knots, which is significantly higher than typical take-off speeds.



*The X-3 Douglas had severe limitations*

This was further aggravated by the stubbed wings, which reduced lift and were prone to structural problems. The aircraft was also unwieldy, especially at slow speeds. This not only introduced trouble while landing and taking off but also in flight.

Test pilot Joseph A. Walker had a near-lethal experience on October 27, 1954, when at 30,000 feet and Mach 0.92, the X-3 was subjected to an abrupt left roll. Walker briefly lost control of the aircraft during this roll coupling and experienced high g-forces before he could bring it under control. Post-flight analysis showed that the X-3 airframe had been subjected to its maximum load. Any further stress would have caused the aircraft to break up.

The unexpected issues experienced during the roll was the final nail in the coffin of the X-3 project. The aircraft was grounded for a year after this roll coupling incident and made only 10 more flights before being decommissioned from service entirely. The X-3 was subsequently retired to the National Museum of the U.S. Air Force after it failed to meet its ambitious targets and provide flight data for a Mach 2 cruise.


*Retired!*

Despite this, the Douglas X-3 has a special place in aviation history. The stubbed wing design later inspired the supersonic F-104 Starfighter and the high take-off and landing speeds led to developments in tire technology. It had significant contributions to the development of high-speed aircraft as well. Walker's terrifying roll coupling episode also started an official research program to find its root cause and its solutions, and the X-3 provided vital test data on the phenomenon.

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

## Pilot in fatal Perth plane crash found to have 'drank significantly' hours before aircraft went down

Published by 7NEWS, 09/-03/23

The pilot, who was the sole occupant, died in the crash and the aircraft was destroyed.

A pilot likely drank a significant amount of alcohol the night before he died in a light aircraft crash south of Perth, the transport safety bureau has found.

The single-engine Dynaero MCR-01 plane took off from Serpentine Airfield on the afternoon of December 28, 2020, for a post-maintenance check flight.

When the plane reached about 300 feet above ground level, the engine began to run rough.

The pilot started to turn left, but the aircraft appeared to decelerate, before it stalled and crashed into the ground.

The pilot, who was the sole occupant, died in the crash and the aircraft was destroyed.

*The Dyn'Aéro MCR01 is a two-seat, low-wing, all-composite carbon fibre light aircraft that was originally manufactured by Dyn'Aéro in France, and is now available both in kit form and ready-to-fly. It is powered by a 100 hp Rotax 912.engine.*

The Australian Transport Safety Bureau on Thursday released its final report into the incident, finding multiple tasks in the aircraft's return to service were not adequately carried out.

The engine's left carburettor was missing a component and contained a significant amount of contamination, the report stated.

The pilot was also unfamiliar with the aircraft and engine type, which increased their risk of not being able to adequately manage an in-flight emergency.

The safety bureau also found the pilot had probably consumed a "significant amount" of alcohol the night before the incident, which increased their risk of post-alcohol impairment.

A number of airfield members had met for an informal social dinner the previous night, with witnesses saying the pilot engaged in "fairly heavy" drinking and appeared "really drunk".

The function ended about 1.30am on the day of the accident.

"Post-alcohol impairment can increase the potential for spatial disorientation for up to 48 hours," the report stated.

"While a pilot may be legally able to fly eight hours after drinking, the residual effects of alcohol may seriously impair their performance when they need it most, such as during an emergency."

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

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

1. What causes the increase in stall speed when in a level turn?
   A. Because the vertical component of lift must be increased to create the turn.
   B. Because of the increased loading in a turn.
   C. Because the increased drag in a turn tends to reduce the airspeed whilst turning.
   D. Because weight increases in a turn.

2. Why is it so dangerous to operate an aircraft with the centre of gravity behind the Flight Manual or POH stated aft limit?
   A. The aircraft will fly nose-high and limit forward visibility.
   B. The aircraft will be difficult to flare for landing.
   C. The thrust-drag couple will diminish and limit lateral stability and control.
   D. The Lift/Weight couple could reverse its direction of action rendering nose-up/down pitch control non-existent.

3. You are in a steady left banked turn and notice the ball is out to the left. In relation to this, which of the following statements is the most correct
   A. The ball indicates the aeroplane is slipping.
   B. The ball indicates the aeroplane is skidding.
   C. The ball indicates the aeroplane is crabbing.
   D. A and C are both correct, depending on any wind velocity affecting the aeroplane.

4. A pilot finds that he can upload 18kg of petrol and remain within his MTOW. If the relative density of petrol is 0.72, how many litres will he upload?
   A. 18 litres.
   B. 23.5 litres.
   C. 25 Litres.
   D. 28 litres.

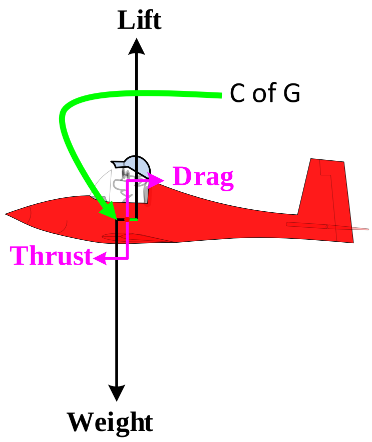
5. Why does an aeroplane yaw when the wing drops in a wing drop stall?
   A. Because the rise in drag on the stalled and dropping wing is greater than the drag on the other wing
   B. Because of adverse yaw from the aileron when the pilot attempts to raise the wing with the stick.
   C. Because of the off-set in the rudder to counter slipstream effect in cruise.
   D. Because of imperfections in the airframe.

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 +64 400 89 3632), or email me at kni.rob@bigpond.com.

1. B is correct.
   An aeroplane in a level turn suffers loading caused by the acceleration towards the centre of the turn. Increased loading, just like increased weight, will increase the stall speed.

2. D is correct.
   In normal flight, the four forces acting on the aeroplane, lift, weight, thrust, and drag, are arranged in a special way so they form two couples. The lift/weight couple tends to push the nose down and the thrust/drag couple, pulls the nose up.
   If the centre of gravity of an aeroplane is too far aft, the couple can reverse the direction of its action and then both the thrust/drag AND the lift/weight couples will pull nose up. This us uncontrollable by the pilot.




3. A is correct.
   The ball out to the left indicates that the aeroplane is slipping and that pressure on the left rudder pedal is required to correct it.
   Note that the ball only indicates slip or skid so options C/D cannot be correct. Crab is not indicated by any common flight instrument.

4. C is correct.
   Relative Density is the comparison between the weight of a substance and the weight of the same volume of a given reference material, usually for liquids, water. This makes the following formula simple to operate

   - weight = RD x given volume, or, transposed,
   - volume = weight/given volume / RD.

   We are looking for a volume (litres) so if we take the weight of 18kg. and divide it by 0.72, we get 25 so the pilot can load 25 litres of petrol at that RD.

5. A is correct.
   At and after a wing has stalled, there occurs a massive change in the lift and drag produced by that wing. The lift suffers a massive decrease and the drag the opposite – a very substantial increase. So, as the wing drops because of the massive lift loss, it's as if God reaches down, grabs the stalled wing and pulls it backwards. This will make the aeroplane yaw. Notice that the yaw is in the same direction as the dropping wing.

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

# Aircraft Books, Parts, and Tools etc.

**Contact Rob-on mobile – 0400 89 3632**

## Books (Aviation)

| NEW Item | Condition | | Price |
|---|---|---|---|
| **Flight Briefing for Pilot**<br>***By Birch & Bramson*** | **Excellent** |  | **$25.00** |
| **Mechanics of Flight**<br>***By A. C. Kermode*** | **Little used** |  | **$25.00** |

## Books (Aviation) (Selling on behalf)

| NEW Item | Condition | | Price |
|---|---|---|---|
| **RA-Aus Pilot Certificate**<br>**Ground Training Manual (102)**<br>***By Dyson-Holland*** | **Brand new** |  | **$49.00** |
| **RA-Aus Pilot Certificate**<br>**Ground Training Manual (103)**<br>***By Dyson-Holland*** | **Brand new** |  | **$49.00** |

## Tow Bars

| Item | Condition | Price |
|---|---|---|
| Tailwheel tow bar. | Good condition | **$50.00** |

## Handheld Radios (Selling on behalf)

| Item | | Price |
|---|---|---|
| ICOM VHF Transceiver, Model: IC-A22E<br>With<br>• Battery,<br>• Cigarette lighter power source, and<br>• 240V battery charger. |  | **Open to Offers** |
| ICOM VHF Transceiver, Model: IC-A6.<br>With<br>240V charger but no dock to recharge battery *(available on EBay)* |  | **Open to Offers** |

## Cockpit Electronics (Selling on behalf)

| Item | | Price |
|---|---|---|
| TRANSPAK GPS Personal Navigator<br>Complete with<br>• Carry bag, cigarette lighter power pack,<br>• AA battery power pack, and<br>• User manual. |  | **Open to Offers** |
| MAGELLAN GPS Model 315/320<br>With<br>• Cigarette lighter socket power pack, and<br>• User manual. |   | **Open to Offers** |

## Other Electronic Units (Selling on behalf)

| Item | | Price |
|---|---|---|
| PALM, model Z22, complete with<br>• CD software,<br>• 240V charging unit<br>• Linking cables etc.,<br>• Still in original box. |   | **Open to Offers** |

## Other Electronic Units (Selling on behalf)

| | | |
|---|---|---|
| Flight Cell 2GO. Mobile phone to Headset interface<br>• With user guide, and<br>• Includes cable etc.<br>See: www.flightcell.com for details |  | **Open to Offers** |
| NAVMAN. Model MY 50T automotive GOPS system<br>With<br>• CD, and<br>• Cigarette Lighter socket power supply. |  | **Open to Offers** |

## Aircraft Magnetic Compass (Selling on behalf)

| Item | | Price |
|---|---|---|
| Wired for lighting<br>• Top of panel mount,<br>• Needs fluid replenished. |  | **Open to Offers** |

## 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@bigpond.com

# Aircraft for Sale

## Kitset - Build it Yourself

**$1,780.00 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.
- All instruments including,
- A Navman flow meter,
- A Powermate rectifier regulator,
- A ballistic parachute,
- A 4-point harness,
- Set fibreglass wheel pants, and
- More.

*Box sections and tubes*

*Flow Meter, Navman, Ballistic Chute, etc*

**A very comprehensive kit of materials**

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

Or Mob: 0419 758 125

*Ribs, tubes, spats, etc*

## Thruster T85 Single Seater for sale.

**$9,750.00 NEG**

Beautiful classic ultralight single seater taildragger Thruster for sale; to good Pilot. Built in 1984, this is a reluctant sale as I inherited Skyranger V Max and two aeroplanes are too many for me.

*The aircraft at Kentville*

*New Engine Rotax 503 Dual Ignition has only 10*

*Fuel tank*

*Instrument panel*

### Details

| | |
|---|---|
| Built - 1991 | Serial Number - 312 |
| Model - Thruster 85 SG | Rego Number – 10-1312 |
| TTIS Airframe - 638 | Original logbooks - YES |
| Engine - *NEW* Rotax 503 DIUL | Next Annuals due – 05/11/2023 |
| TTIS Engine – 10 hours | Propeller – Sweetapple, Wood, 2 Blades (as new) |

Instruments - RPM, IAS, VSI, ALT, Hobbs meter, New Compass, CHTs, EGTs, Voltmeter & fuel pressure gauge

Avionics - Dittel Radio 720C and new David Clark H10-30

Aircraft is fitted with Hydraulic Brakes. Elevator Trim. Landing Light. Strobe Beacon. Auxiliary Electric Fuel Pump is in excellent mechanical condition, and the skins are "as new".

**Offers considered. Call Tony on 0412 784 019**

## AIRCRAFT for Sale - LIGHTWING GA-55.

## Registered 25-0374


**Engine ROTAX 912,       80HP,       853.3 Hours**

Reluctant sale of this great aircraft, I have owned her from June 2004.

Excellent fabric, Red and Yellow, always hangered, and comes with the following extras:

* 2 Radios
* Lowrange GPS
* EPIRB
* Aircraft Dust Covers.
* Manuals – various
* Fuel Pressure Gauge
* Extra Tachometer
* New Headsets
* Paint
* Oil

**Work performed at Lightwing Ballina:**

* Wings recovered, tanks resealed, new brakes, wheel bearings and hubs, new wing tips.

**Other work carried out:**

* Windscreen replaced, door panel replaced, choke cables replaced, ignition upgrade.

**Rotax:**

* Engine modifications, gearbox rebuild.

Currently hangared at Boonah in Queensland.

## Contact Kevin McDonald on 0419 607 637

## 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**

# Aircraft Engines for Sale

## Continental O200 D1B aircraft engine

Currently inhibited but complete with all accessories including,

- Magneto's,
- Carburettor,
- Alternator,
- Starter motor,
- Baffles and Exhaust system, and
- Engine mounting bolts and rubbers.

$POA

Total time 944.8 hours. Continental log book and engine log are included.

**Phone John on 0417 643 610**

## 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 contact…..

Kev Walters on Tel. **0488540011**



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