BRISBANE VALLEY FLYER

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BRISBANE VALLEY SPORT AVIATION CLUB INC

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

The only Colby-503 in the world – taxiing at Watts Bridge.

See page 4

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Terminate your turn.

By Rob Knight

Exiting a turn is simply rolling out to wings level – right? Wrong!

Unless you delight in wandering aimlessly about the blue, you will be exiting the turn onto a pre-selected reference point. If a pilot is flying just for the joy of flight, then being aimless is no handicap except that it can lead to bad habits – how much better to do it properly so the skills are there when needed. This includes the other pilot type that I experienced when I was examining. They leave the exit far too late, suddenly ramming home full out of turn rudder and hope that a full application of aileron would balance both the adverse yaw AND roll back to wings level – all without further movement from the reference point. They would be wrong on both counts and also, in some cases, infringe the maximum manoeuvring speed (the maximum airspeed at which a full application of any control may be used). Needless to say, flying an aeroplane outside its flight manual stated limitations is a bit of a no-no, and such pilots did some revisional training before re-applying for a test.

So what is the best way to exit a turn? Flying causally we can just roll out by applying a little aileron to level the wings slowly, co-ordinating the aileron with sufficient rudder to maintain balance. However, for those amongst us who seek precision in their flying, it can be a challenging exercise.

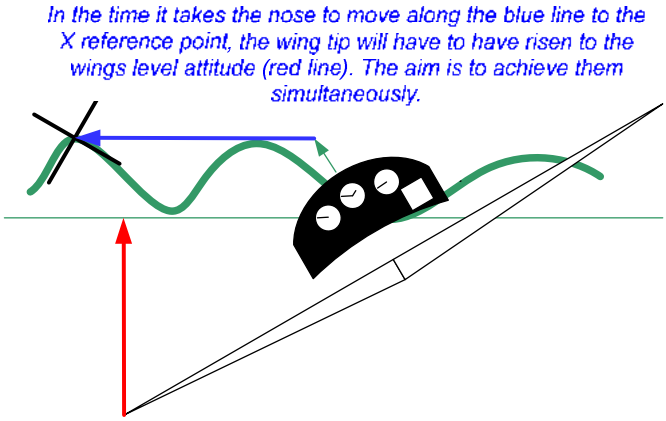
For a precision exit, three steps must be pre-determined. First we must pre-select a reference point to be wings-level on when the exit is complete. If we don't know where we want to be when we are finished, we can't know when to start. Then we must decide on a roll-out rate- Is it going to be a rapid roll-out or a slow one. This determines where in the turn we must start the exit process, because we are planning to be wings-level ON our pre-selected reference point on the horizon. Another consideration with this step is an appreciation of the time it will take to roll back to wings level. For any angle of bank, the steeper the turn from which we start, the longer it will take us to roll back to wings level. The last step is to select a point upon the horizon on which we will begin the roll-out process.

The first step is easy – Just select a prominent point on the horizon then **REMEMBER IT** – some of my candidates have selected a reference point and then forgotten what it was – WARNING - having a reasonable short term memory is a pre-requisite for being a pilot, so don't demonstrate your lack of one.

The second step, deciding on the roll out rate, has a few more factors to consider. Which is easier, a rapid roll rate or a slow one? Unless we are doing a maximum rate or emergency turn, a lower roll rate is generally easier for a precise exit because there is more time to use accurately coordinated rudder.

The third step is to decide where to start the process, and this is inextricably linked to the desired roll-out rate required. The slower the roll-out rate used, the earlier in the turn (more degrees yet to turn) the exit must be begun. This is the step most missed by pilots. Because they have no exit plan, they decide to exit too late and suddenly have to slam the stick over and boot in rudder, hoping the proportions are correct. Alas, they seldom are. The exit is too often completely out of balance as the aircraft slips or skids out of the turn, and finishes nowhere near the desired direction. Now an extra turn of turns is required to end up with the aeroplane heading in the desired direction.

As stated previously, exiting maximum rate or emergency turns are exceptions and a slower roll-out rate may not be applicable. Practicing these turns and their roll-outs will sort out the necessary piloting skills for those who wish to acquire them. For the rest of us, flying for fun, we will get best results from a slower and more measured exiting technique. A yank on the stick coinciding with a boot full of rudder followed by bags of fervent hope and wishful thinking seldom reaches any degree of proficiency. Why not take a couple of seconds to do them properly?



So what is the secret? There really isn't one, except to operate the controls gently and **fly** the aeroplane out of the turn. How?

1. Continue your lookout and check/select your rolled out reference point.
2. Begin roll out with aileron, balancing adverse yaw from aileron input with coordinated rudder.
3. Check the arc distance remaining to your wings level point and decide if the rate of roll-out being used will see your wings level as you reach the reference point. It is notable, here, that you are balancing two things, the reducing distance to the roll-out point and the reducing rate of turn as your aeroplane's bank angle diminishes. As the nose gets proportionally closer to your selected roll-out reference point, so should the wings get closer to being level. Correctly judged and carried out, both should occur simultaneously. Having an awareness of this exercise, and practicing it, will see you achieve with ease the coinciding of wings level as your selected reference point is reached.

In conclusion, although I have been advising that it is easier to enter and exit a turn if the roll rate used is not excessive, there is another good reason for not using a full application of any control. This is to ensure that you don't exceed the previously mentioned maximum manoeuvring speed (or V_A). Applying a full deflection of controls at or above the V_A may see your aeroplane suffer structural damage.

Hints:

- **LOOKOUT**
- Select your rolled-out reference point before beginning your turn exit.
- Maintain height/airspeed during the turn
- Maintain balance during the turn (no slip or skid unless deliberate).

Make, your every turn onto final approach a precision one.

Happy flying

I Fly The Colby

By Rob Knight

SSHH! I don't fly in the Colby 503, I wear it!

It is as close as I can get to strapping a device onto my butt and sharing aviation with a machine. Having an empty weight of only 164 kg , and a maximum take-off weight of 300 kg, it's like a kitten playing with a piece of wool in light wind gusts. It has 15% more wing area than a two-seat Piper Tomahawk and, with 48 hp, only a little less than half the Tomahawk's power. With all this, and a wing loading of just 22.4 kg/m^2 compared to the Tomahawk's 65 kg/m^2, is it any wonder that this little low range rocket has attitude to burn.

The Colby 503

I met the Colby when I was looking for a single seat aircraft that I could trailer easily. Nothing flash, just simple, and when I saw a Flight Star for sale near Melbourne I started planning a voyage to the nether states to view it. Hearing about a local Brisbane example, I called the owner, Colin Thorpe, and asked if I could look over his for any special items to check before my money changed lanes and went south. Ever affable and obliging, Colin invited me down to the hangar at Heck Field to view his masterpiece.

I thought that it looked neat and sporty; light blue and white with a black boom and it was love at first sight. The pod, wings and tail empennage were all good; the fabric unfaded and in good condition. Colin had flown 165 trouble-free hours over much of lower Queensland so the airframe was well tested. The aircraft registration status was current and all it needed was to be test flown. With little hesitation I agreed to buy it subject to satisfactory flight testing and, as Colin's pilot certificate needing renewing, we agreed that I would do the testing. A fortnight later I was the proud owner of the only Colby 503 in the world and flying this neat little machine back to HQ at Boonah in Queensland.

The test flight had been uneventful. Its take off proved as short as the book suggested and climb-out at Vy was phenomenal. In cruise, I had to pull the RPM to 5300 to cruise level at 55 knots – playing with the throttle quickly demonstrated that if I applied full power I could exceed the Vne of 65 knots even in a climb. Visibility was superb; the low pod-nose profile gave fantastic view ahead. In fact, maintaining height and 55 knots needed the pointy bit of the pod nearly 30° below the horizon.

After refurbishing, the aircraft flew even better. I had re-rigged the ailerons to droop 5° as suggested by Pioneer on-line details. The bungee shock cord suspension was wonderfully soft and stretched bumps into vague mounds and dips. But the softness was also a drawback – lateral rolling would be a problem in operating across the wind on the ground.

Having no brakes the Colby main wheels must be chocked for parking and starting. Engine starting is simple - fuel cock on, choke on, mag on, them bring the fuel pressure up with the rubber bulb until it was lightly firm. Call to clear the prop, grasp the pull-start handle firmly and pull the engine over. It

usually runs on the second or third pull. Set the idle to 2500 RPM. Choke to off, and then get seated and harness up. Headphones and radio on. I have a Yaesu FT-230 clipped onto a bracket mounted on the top of the fuel tank which puts the radio comfortably between my knees and within easy reach. With a PTT switch velcro'd onto the stick the system works just fine. When the CHT's and EGT are in their required ranges, make a radio call and taxi. Here's a BIG caution. With no brakes and a powerful engine, taxi speed rise is exponential and cannot be allowed to get high. With the boom and motor so high, and the stretchy-cord suspension, fast cornering causes listing that the Titanic would envy and, if the wind got under a wing, a wing-tip strike would be inevitable.

DVAs are simple – Fuel Recall the dipped contents - endurance sufficient for flight, Instruments – left to right, harness tight, radio secure, check full-and-free controls. How simple is THAT!

No traffic – call for enter, line-up and roll, and by the time the throttle is open the aircraft is airborne, 30 feet AGL, and climbing. The speed must be curtailed by raising the nose. At 31 knots, 24.3 seconds on the stopwatch will see 500 feet change on the altimeter. This equates to 1240 feet per minute. At this airspeed the climb angle is phenomenal and is like going up in a lift with windows.

Climbing, there is time to gather a feel for the controls. For such a light aeroplane the ailerons are heavy. Large and full span and they give a roll rate comparable to a Cessna 172. The elevator is much lighter and very lively making it easy to over control in pitch. The rudder, also heavish, is adequately effective and average in weight and response.

Levelling off follows the same process as with any other light aircraft – first attitude and then power back to cruise. In the Colby the power must be reduced quickly to avoid exceeding the Vne. Level cruise at 5300 RPM gives about 55 knots and, at my weight and with half a tank of gas (20 litres), it flies hands-off. The visibility is marvellous – over the nose or out to either side. Looking over the side I can see the wheels slowly revolving in the airflow. I reach out and stop them with my fingers. In how many other aircraft can you do that, eh?

Turns are straightforward. The right amount of rudder to balance the aileron drag just seems to happen and, while there is plenty of adverse yaw, co-ordination poses no difficulty. However, in the climbing turn I notice a very marked tendency to overbank, a function of the light wing loading. Level turns hold no surprises and 60° turns just seem to happen.

All non-powered stalls result in a sinking mush with a bobbing nose attitude. I don't like doing stalls in the Colby - this 503 is free-air cooled and it is easy to encourage under-lubrication and over-cooling issues at lower power settings with the 2 stroke engine. With power on it is reluctant to stall at all. The ASI reads about 8 knots but the high nose attitude causes position error making instrument indications improbable. Needless to say, the airspeed is very low, around 15 to 18 knots I would guess from the airflow through my hair. Lateral control is vague but it just sinks, nose high,

and with the wings level. I have never tried a full power stall, engine operating parameters preclude it.

The glide ratio lists as 7:1 on the performance schedule. I believe it! But, as a rule I don't glide it – I make power on descents to minimise engine over-cooling. If the engine failed and I need glide range then I might use the book value of 30 kts but this IAS is too slow for normal approaches. The aeroplane has bags of drag, and gusts immediately slow the aircraft so when the gust has passed the airspeed decay is rapid. I maintain a minimum of 45 knots on a calm day and 50 knots if I suspect a few gusts.

With such a low cruise speed my downwind height in the circuit is 500ft. The checks are just to think about the fuel/time remaining in the tank, harness tight, and lookout. Base turn is just past the runway's end and the steep glide angle makes it easy to meet the flare point just inside the runway boundary. Float is short and the aeroplane settles into its feather-bed-like undercarriage oh so sweetly. With the elevator close to the trailing edge of the main-plane, its effectiveness is quickly lost without slipstream and the nose quickly settles itself onto the grass. Holding back elevator to unload the nose wheel, the speed rapidly falls. The distance I use on a normal landing over 15 metret obstacle is around 100 metres but a short landing in the right conditions would reduce that substantially.

Looking at this sweet little aeroplane sitting on the ground makes me want to grin from ear to ear. It is like a model aeroplane – but one that I can actually fly. It might be a toy, but it's the best toy that I have ever had.

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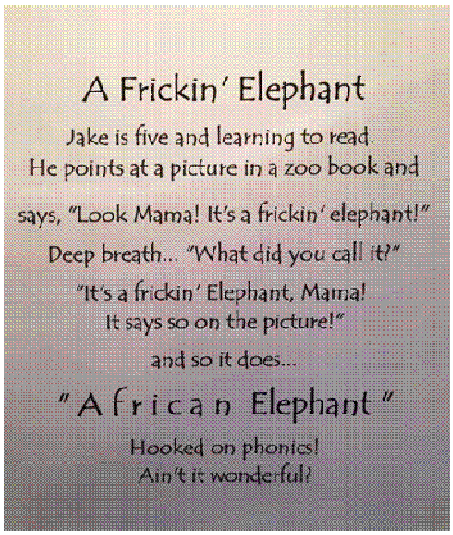

X-Plane

The Low-Boom Flight Demonstrator would travel at 1.4 times the speed of sound without producing a sonic boom.

By Hanneke Weitering, SPACE.com

NASA has taken a huge leap forward in its quest to create an aircraft that can travel faster than the speed of sound without causing an ear-splitting sonic boom.

The space agency announced April 2 that it has awarded the aerospace company Lockheed Martin a $247.5 million contract to design and build a new X-Plane, known as the Low-Boom Flight Demonstrator (LBFD), which may soar silently over the US by 2022.

Today's announcement comes less than two weeks after President Donald Trump signed a federal budget for FY2019 that fully funds the LBFD. In his budget proposal, Trump noted that the X-plane "would open a new market for US companies to build faster commercial airliners, creating jobs and cutting cross-country flight times in half."

But don't expect to board a supersonic passenger jet anytime soon; Lockheed Martin's LBFD won't be built for transporting people. Before any supersonic planes will be allowed to fly over land, NASA and Lockheed Martin must prove that it's possible to break the sound barrier without the sonic boom.

"This piloted X-plane would be built specifically to fly technologies that reduce the loudness of a sonic boom to that of a gentle thump," Jaiwon Shin, associate administrator of NASA's Aeronautics Research Mission Directorate, said during a news conference today.

Shin added that the LBFD will fly over select US cities starting in mid-2022 and NASA will "ask the people living and working in those communities to tell us what they heard, if anything."

NASA will then send the "scientifically collected human response" data to the US Federal Aviation Administration and the International Civil Aviation Organization "so they can use the data to change the current rule that completely bans civil supersonic flights over land," Shin said.

"When the rule is changed, the door will open to an aviation industry ready to enter [a] new supersonic market in our country and around the world," Shin said. "This X-plane is a critical step closer to that exciting future."

The LBFD aircraft will be 94 feet (29 meters) long, or about the size of a small business jet. It will fly at a cruising altitude of about 55,000 feet (17,000 meters) and reach a speed of 1.4 times the speed of sound (about 1,000 mph, or 1,600 km/h). This will "create a sound about as loud as a car door closing," NASA officials said in the news conference.

While NASA is working to reduce the sonic boom, other companies are working on their own supersonic aircraft designs — all of which will still create sonic booms during flight.

Virgin Galactic has partnered up with Boom Technology to build a supersonic passenger jet called "Baby Boom" that could fly across the Atlantic Ocean at twice the speed of sound, cutting flight times in half. Those test flights are scheduled to begin in 2020. Another company, Spike Aerospace, aims to test its S-512 Supersonic Jet by the end of 2018.

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FAA Approves Terrafugia Petition for LSA Certification

The flying car's weight limit now legally exceeds 1,430 pounds.

By Rob Mark

With its wings folded, the Terrafugia Transition can operate on the same roads as automobiles.

The FAA says the Terrafugia Transition can now be called a light sport aircraft despite the fact that its maximum weight is 370 pounds greater than the standard LSA 1,430-pound limit. Terrafugia

petitioned the agency for the exemption to use the LSA label for a street-legal version of the aircraft back in 2014. Although the Transition can be flown like a traditional two-place aircraft, the pilot can also fold its wings after landing to allow it to operate over the same roads as any automobile. Terrafugia told the FAA the weight-limit increase was needed to accommodate structures and systems directly related to the vehicle's unique safety features. They allow the Transition to incorporate automotive occupant protection safety features, including a safety cage, energy-absorbing crumple zones, and cabin features commonplace in today's automobiles but unavailable in most general aviation aircraft.

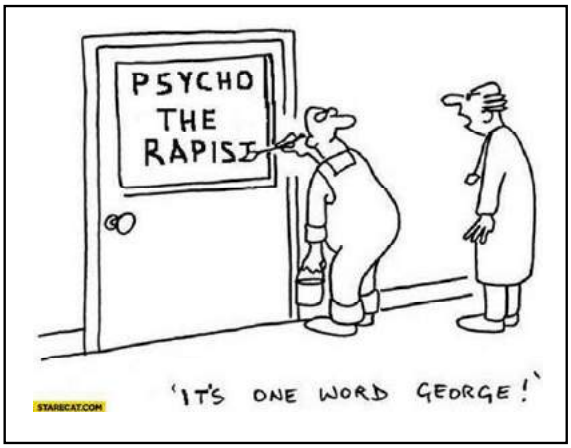
To support its petition, Terrafugia engineers quantified the Transition's potential safety benefits by citing a company analysis that compared traditional LSA airplane accidents to what might be experienced in the Terrafugia. The company said the results showed that flying a Transition instead of the accident airplane, could have reduced the severity of injuries in the vast majority of accidents and also could have more than halved the number of fatalities. In addition to its automotive safety features, the Transition's ability to land and drive in bad weather could have helped to avoid nearly half of the accidents studied.

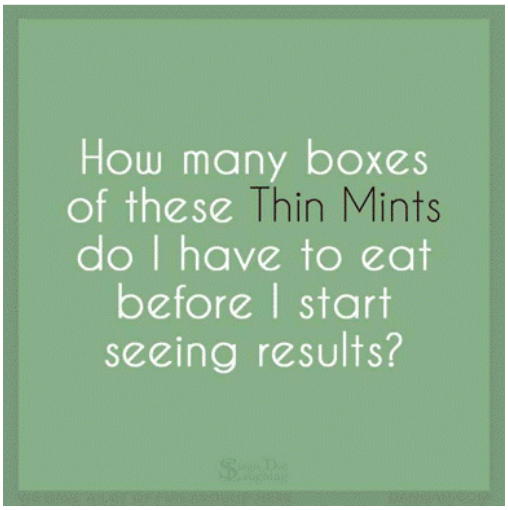
FLY-INS Looming

13/10./018	Murgon (Angelfield)	Burnett Flyers Breakfast Fly-in
03/11/2018	Warwick	Warwick Aerodrome's 60th Anniversary BBQ

A bloke walks into the Sydney library and says to the prim librarian, 'Excuse me, ya gotny books on suicide?'

She stops doing her tasks, looks at him over the top of her glasses and says, "No way, cos ya won't bring it back!





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

1. The text books state that when turning the stall speed increases. Why?
   A. Because of Newton's laws of motion when changing direction.
   B. Because of the rise in load factor.
   C. Because the airspeed tends to decrease.
   D. Because of the change in angular momentum.

2. Which of the following options is the most correct?:
   A. Increasing weight increases an aircraft's take-off speed.
   B. Increasing weight decreases glide range at best L/D.
   C. Increasing air density increases drag and thus decreases the rate of climb at Vy.
   D. All the above are correct.
   E. A and B are correct.

3. In sustained level flight at a constant RPM and airspeed, why do the propeller tips have a higher airspeed than the propeller inner sections?
   A. Because of the pitch changing along the blade
   B. With changing pitch along the blade the angle of advance modifies the airspeed.
   C. It only occurs when the working pitch is greater than the slip
   D. Because each propeller blade section operates at a different radius from the hub

4. When turning at reduced airspeed at 45 ° bank (compared to normal airspeed):
   A. The rate of turn will be reduced.
   B. The rate of turn will increase.
   C. The stall speed will be lower.
   D. The stall speed will be higher.
   Note that more than one answer may be correct.

5. You calculate during your pre-flight planning for a cross country flight that you have 6° of drift to port. This indicates that….
   A. The weather towards your destination is likely to worsening.
   B. Your altimeter will read low if you don't reset the QNH for the destination.
   C. The weather towards your destination is likely to improve.
   D. Cloud cover towards your destination is likely to reduce.

ANSWERS: 1. B, 2. A, 3. D, 4. B, 5. A.

If you have any problems with these questions, call me (in the evening) and let's discuss it! Ed.

BRISBANE VALLEY SPORT AVIATION CLUB Inc

Please note that minutes of the 2017 AGM AND MINUTES FOR THE LAST Club meeting have, for this month, been distributed under separate cover.
Please see emails from Peter Ratcliffe.