



Why die by driver fatigue in a driver-less car ?!

Australian Light aircraft domestic private personal usage and logistics of newer technology since 2013 “Amateur experimental home built kits”

(March 2020) The audience for this article is the “average wage earner” (thereabout – AND/OR tradies or alike metal and motor mechanical skill). Worst case scenario of cost of a “self built” DIY kit 4 seat STOL here is near 100k AUD by flight if you are a motor mechanic for some plans built 30k AUD is the best scenario.

WHY 4 SEAT STOL ? At 26:30 in the following historic record film (“Get Goring”) the US Army 36th Infantry, 636th Tank destroyers, and 142nd Infantry - Intelligence recon. in 1945 during WW2 with their USAF PA-Piper 2 seat (forerunner of 2 seat super STOL’s) can show you how excessively limited and unsafe 2 seat aircraft are... NB: The pilot of the L5 Captain “Bo” Foster was 99 years old in 2011 (October 9, 1911 – March 21, 2011)
<https://www.youtube.com/watch?v=pkC7fTVbWck>

DIY kit 4 seat STOL bushplane -What to do? cost! If you are about to buy an absolutely new car, downgrade it to a low km's second hand cheaper brand, function-ate of the type-capacity-space you require to cut away 30k of cost. Note: Don't ever buy an aircraft more than 10 years old - this country is dying of them!

If you are a e.g. ‘Company CEO’, ‘Highly paid professional’ [not small businessman – “motorhome” is the clue in one vid on these] or ‘head of Dept. doctor’

can afford a factory full legal warranty aircraft as any factory new cheapest end Piper, Cessna, Socata, Mooney e.t.c. ,,,

then the following few lines of links will be more useful, ‘these’ (next links) can leave the factory in Bush-plane configuration (something like 500k AUD).

Info: Maule M-7-260 STOL **VID (Land): Maule M-7-260 STOL** **VID (Amphibian land): Maule M-7-260 STOL**

VID (Amphib water): Maule M-7-260 STOL

Info: Sportsman 4 Glasair STOL **Vid: Sportsman 4 Glasair STOL**

Please Do Not Attempt to contact me about any of the contents of this document or the origin site "This is simply free information !"

(NOTE some “links” in this document “download PDF documents” from govt. aviation sites and some are “embedded videos”)

This page should also be read with this online document:

<http://windsolarhybridaustralia.x10.mx/light-aircraft-ppl-vh.html>

"Road vehicle "is" the wrong way" to travel large distances in Australia for personal and business! (PPL Private pilot license and STOL kit light aircraft "VH" registered (<-should) or "Uncontrolled air space unregistered (requires map and landmark reading skills)")
Set online map to 0ft – 8000ft to clear out airspace shown above 8500ft
Uncontrolled airspace is class G and all below 8500ft
<http://xcaustralia.org/aircheck/aircheck.php>

CONTENTS- CONTAINS

(Use " *CNTRL + F* " keys to find word)

- STOL Short Take-Off short Landing
- PPL (Private Pilot License)
- Aircraft icing safety
- Required media software
- Journey fuel "costs"
- Locating sensible property
- STOL tyres - "be aware"
- Engines and Crankshaft - "be aware"
- CASA curriculums for PPL RPL
- Importing kits aircraft and parts
- Note plans building methods
- Aircraft operation fuel systems
- Light Aircraft Kits and suppliers
- Instruments and critical systems
- Vehicle Electrics
- Instrument controls Panel parts
- Australian Airspace
- ATSB information and incident documents
- Australian incident case VH-MDX
- *and mono sodium glutamate*

More also requires to be done to standardise smaller communities and remote AKA-"locations" with having landing take-off strips (that also allow light twins) nearby without serious requirement for public transport to pass them, this all over Australia!

Too, public distance commute strips and parking en mass area for near city size towns! *

** This requires the possibility of philanthropic effort owing to the fact governments do not get moved easily to action and particularly for a location such as small town with public transport (e.g. train station and regular intercity service) on the edge of controlled air space skirting a city to extend usefulness of uncontrolled air space.*

***** (Home property) For 4 seat STOL at least 8 acres (3.3 Ha) (32374.9 sqM) of land with no obstacles at either end of the roll ground inside or out of the property and 180 meters clear ground roll required unless you can park somewhere "in a hangar" (elongated 6 acres (2.5 Ha) (24281.1 sqM) MIN. if it is a long block) (and the mentioned six seat at least 230 meters clear ground roll minimum 'elongated 9 acres' (3.65 Ha) (36421.7 sqM)).**

(Australia (CASA) Amateur experimental **DIY kit 51% rule**)

Australia CASA and USA use a builder / manufacturer 51% rule of which the USA FAA calls “Major Portion Rule” along with stipulating the types of “builder” e.g. amateur or professional.

The main “part of” the 51% rule pertains manufacturer and builder by point of responsibility and liability.

Australia has “1998 Experimental Certificate CASR 21.191” and “AC 21.29(0)” commercial assistance rules.

The final point , the pre manufactured kit parts/sections will add to 49% of the fabrication of the aircraft , the other 51% the home amateur builder.

[Link \(PDF\): Amateur-built and experimental aircraft](#)

[Part 1: A survey of owners and builders of VH- registered non-factory aircraft](#)

[Link: Amateur built and experimental aircraft](#)

Why NOT helicopter kits DIY ! (Well... NO! – but with the money that’s individual choice)

Because any helicopter kit DIY or anywhere near the handle-able price range of the average Australian wage to build and acquire over a couple of years is

1. too expensive ,
2. Cannot carry a sensible payload (pilot fuel and anything else carried added) of weight ,
3. too slow travel time ,
4. too short journey range. While "too expensive" there is only [one sensible version DIY kit helicopter made in USA called Vertical Hummingbird 300L](#), at around 200K AUD.

Current kit designs

STOL 4 seat “kit” rarely for most reach 100K AUD cost by ready for flight

with the cheaper selection (not necessarily the best choice DIY kit STOL), but not much more than 100k AUD for the more expensive selection of these kit types.

The six STOL 4 seat light aircraft designs in this article are modern 21st century learned design, quite well tested and robust.

To this date 2019 - I have found only 7 reliably utilized STOL 4 seat full weight designs for reasonable price as 'DIY kit systems' and found *an almost STOL "six seat" (slightly more functional than honorable mention) as DIY kit system design and option to build but it requires some real runway length* ([*six-seat] 240 meters same as an ordinary 2 seat full weight light aircraft).

Current STOL designs By precedence of performance and price...

("roll" is take-off) ! G force rating +/- is better than ordinary light aircraft (robustness, maneuver, vibration)

* A minor possible problem for STOL use is "understanding and requiring to" have a fuel tank outlet on the underside rear of the fuel tank(s) **AND a fuel booster pump near the tank(s) feeding through a one way valve to the main fuel line in front of the other tank fuel line connectors** for when the nose tilts up and the bottom of the engine is level with the fuel tank during steep climbing at take-off or other high angle maneuver, the booster pump can force fuel to the engine fuel pump (all bottom four mid-side points of a tank helps). *note: "Dry sump" engines require scavenging, with heavy angle maneuvering fuel can require scavenge.

"Barrows Bearhawk and Bearhawk-B" (*B is the actual STOL 4 seat STOL / USA) roll 400ft (121 m) [excellent long journey to remote area very good load carrier for non airstrip +/-4G] *1*Gross 2500lb

Murphy Yukon (4 seat STOL / Canada) roll-400ft (121 m)[good long journey to remote area good load carrier for non airstrip (+/-4G ?*info reliable*] * Extremely easy to build from kit

Zenith CH-801 (4 seat STOL / USA) roll-300ft (92 m)[excellent 'shorter' long journey to remote area median load carrier for non airstrip *where the same fuel tank from start does the return journey*]

Backcountry Boss (4 seat STOL / USA) roll-400ft (121 m)[good shorter long journey to remote area median load carrier for non airstrip]

Dream Tundra (4 seat STOL / Canada) roll-400ft (121 m)[excellent long journey to remote area good load carrier for non airstrip]

(Wag Aero -metal wing) Sportsman 2+2 (4 seat STOL / USA) roll-400ft (121 m)[ok 'shorter' long journey to remote area median load carrier for non airstrip where the same fuel tank from start does the return journey]

Tapanev Levitation 4 (4 seat STOL / Canada) roll-400ft (121 m)[good 'shorter' long journey to remote area median load carrier for non airstrip *where the same fuel tank from start does the return journey*]

*****following six seat in its' own class as almost STOL

Murphy Moose (6 seat - almost STOL / Canada) roll-600ft (182m *Vedeneyev M-14P 360 HP engine)[good long journey to remote area good load carrier median ok for non airstrip] * Extremely easy to build from kit

Anything else may not be "suitable" to Australian environment conditions and unknown for levels of testing

*(Tapanev Levitation 4 is the only unknown for testing , most designs have been produced and used for around a decade)

=====

Honorable mention.....

Bearhawk Patrol (full weight)

(2 seat STOL / USA

roll-250ft (76 m)[excellent long journey to remote area very good load carrier for non airstrip] can carry much the payload of a 4 seat by specification *1*Gross (2000lb , 907 kg) [210 litres x 0.718 grams = 150Kg] [Empty weight 431 kg + 150 kg = 581 kg] [gross-max 907 kg - 581 kg = 326 kg payload] [2 x (80 Kg FAA people) = 160Kg] [326 kg - 160 kg = coincidentally another 160 kg is the cargo payload maximum aside two people also !]

BELOW - Proper range calculation for the above aircraft

(note: 4 stroke aircraft engines also burn oil p/hour rating)

Lycoming O-360 , 180 hp (130 kW) (34 L) per hour - 230 km/h CRUISE SPEED

((30L x 3.5h) x \$2.00 p/ litre) = \$210

one way Sydney to Melbourne (120hp or 140hp engines and 3 blade Variable pitch Propeller is around 2/3rds fuel cost – e.g. \$150)

210 Litres / 34 p/hour = 6.17 hours

6.17 h - (45 minutes fuel) 0.75 h (minus 45 minutes "safety and standard fuel burning procedures" for 3 x climb , headwind - [accuracy: crosswind - sun-lining / dead reckon systems] - short detour [(3 x take-off, 3x landing, destination , intermission (not refuel) , return)]) = 5.42 hours (use 1 hour - 1.0h not 0.75h for way-point VFR nav.)

5.42 h - (a second 45 minutes fuel) 0.75 h (for go around, holding , site examination AS "45 minute RESERVE" , *other-undefined*) = 4.67 h

TOTAL GEOGRAPHICALLY DIRECT "THEORETICALLY TARGETED POINT TO POINT' JOURNEY ALLOWABLE

(4.67 hours x 230 km) = 1074 km

(667 land miles , 580 Nautical miles)

**** Clause for this layout calculation !!! There will be guaranteed fuel and oil at the destination or a detour at around an hour from the destination en-route to land at 'first' for refueling !!!***

=====

NOTE - ordinary light aircraft ground roll examples:

Cessna 172 Skyhawk 4-seat ground roll - (805 ft , 245 m)

Jabiru j-230D 3-seat ground roll - (741 ft , 226 m)

Piper PA-28 140 Cherokee Cruiser 2-seat (800ft , 243

***** There is a difference between "variable pitch (blade feather)" and "propeller governor"**

A "**propeller governor**" is analogous to control of prop efficiency in relation to engine RPM by using **an adjuster knob to set the calibration of blade feather** angle in a set of operating bounds of angle if there is increase or decrease of RPM - "analogous alike" the distributor spark timing fly weights of an internal combustion piston engine, however the control knob controls what the pitch angle should be after a particular RPM is set.

A "variable pitch propeller" is analogous (metaphorically) to the "transmission gears" of a car relating engine RPM, both engine throttle use to produce RPM and "feather blade angle" (to favor power or speed from the RPM) of the propeller are quite independent pilot controls but have their own individual effect on aircraft speed and thrust power.

The use of the variable pitch system can completely takeover power for low speed flight or high speed low thrust power for cruising speed. Propeller governor system is always largely combined as a 50/50 value effort of thrust power and speed not as manipulable as variable pitch but with properties similar as some of the action of the governor setting is related to the pitch angle allowance for the blades.

Using a 3 blade variable pitch propeller system will allow excellent fuel economy with the high angle setting with a low power engine size and give good engine power harnessing at low angle of feather pitch for takeoff performance and scenic low flying safety at lower speeds.

There is a mild functional methodology and purpose difference between the two feather angle system types but the two are considered interchangeable for purpose (**consult propeller manufacturers and your kit manufacturers technicians**).

The benefit is in power utilization efficiency during take-off and climb, and then better than fixed pitch propeller fuel consumption during cruise. *****

<p><u>Best pick of a "KIT TYPE" for "amateur light plane home builders' by practical experience and economics":</u></p> <ul style="list-style-type: none"> • A reconditioned engine costs around 30k AUD • If you are a mechanic/ or you know you have that ability (e.g. farmers and hobby vehicle restorers) reconditioning an engine yourself brings engine cost to around 15k AUD • New engines are around 50k - 60k <ul style="list-style-type: none"> - Note: engine accessories can cost 3k up to 5k AUD and may not be in an engine deal from a supplier 	
<p>(CHEAPEST) Plans – local materials built only (rummage scavange) (and Plans- "Raw Materials only" kits): - ["Bearhawk B"] (a bearhawk can be self built for as little as 30K AUD to flying – note: some aero retailers sell raw material sets) *Note some designers do not offer “plans”- local material method.</p>	<p>"Experienced tradesmen (either qualified or non-qualified experienced - e.g. Jack of all trades)" whom can handle semi complex trades maths and understand "frame squaring" (symmetry checkup measurements applied in real world for equal proportion accuracy and "measurement tolerances") , motor mechanics , sheet metal fabricators, plumbers, as much general maintenance handyman, with some proper welding experience/training, sheet-metal and pipe, and mechanical assessment/fitting, (general) engineers and (any typeof) university tertiary professionals.</p>
<p>Outright kit systems: ["Murphy Yukon", "Murphy Moose", "Dream Tundra" "Zenith CH-801"] (some parts of the kit type are at skeletal stage and the materials to weld or cover or fit are packed with it) Around 70k - 80k AUD to flying.</p>	<p>"Persons whom know they have the ability to" understand and comprehend new concepts and rules quickly and well and whom know they will be able to finish complex tasks committed slowly and carefully and have good "basic maths" skills e.g. measurement unit conversion, basic ratios, basic fractions/decimal-fraction operations. *note: understand "frame squaring" (symmetry checkup measurements applied in real world for equal proportion accuracy and "measurement tolerances") that would be good (but as it should be).</p>
<p>(MOST EXPENSIVE KITTING) Partial Built Kit section sets: ["Bearhawk" "Dream Tundra" "Zenith CH-801"](whole completed or near completed sections with little to do except bolt things together) Completed, ANY one of these is near or around 100k to flying</p>	<p>Semi skilled non qualified trades people e.g. experienced full scale farmers, farm workers , non qualified engineering firm practical working employees with good basic maths.</p>

(PLANE EXPENSIVE) Completed factory kit: ["Backcountry Boss" and Various other makes/models as mentioned in this article] usually base price is 130k – 190k AUD

...are generally 2.5 to 3 times the cost of Partial Built Kit section complete sets !

(Before bothering to read further) *Life support systems!(air) One of the problems of light aircraft is atmospheric pressure and altitude, so apart fastened polystyrene bicycle helmets during take-off and landing, there is an issue of whether the aircraft you have is pressurized. However, whether it is or isn't, it will have some controls to allow either air venting or pressurizing to occur to keep oxygen levels in the aircraft sufficient (and perhaps temperature). It is important to understand which controls these are, how they function and are to be set, and that they are functioning properly for their "loading" before take-off. Loading is by example whether the aircraft contains 4 people or one person and 1/4 of a million bees, all of them breath air and use oxygen, the more of them there are, the more oxygen is required to be delivered into the machine.

While large companies such as Piper produce super STOL aircraft that can “land and takeoff at 10ft length (3 meters (300cm))”, there are many “KIT” made STOL aircraft can takeoff in an extremely short runway distance, **“HOWEVER” for a reliable SAFE aircraft to use in heavy wind that will not be overloaded or economic impediment by inability to perform useful jobs functionally a “4 seat STOL” that can be used as a bush-plane is required !**

Never attempt to, or use (LSA, Ultra-light or 2 seat aircraft) the +/- G force ability is ALWAYS too low and dangerous for turning and loading and rough landing

Too, these **4 seat STOL kits** have around **+/-4 to +/-6 G force loading** by design, and been available since around 2000 and **reasonably proven by 2013**. LSA, Ultra-light and 2 seat aircraft are too risky a danger have gone on to many sad incidents since. Again, many of these 4 seat STOL full weight aircraft (structure uncompromised) can be made by “Plans building” (buying their plans only) and locally sourcing all materials and using their makers online tutorials, significantly reducing cost to below that of *quick build kit* systems.

One aircraft (almost 1100kg “total” max. takeoff weight) mentioned in this document can be built from blueprint-plans with Aircraft aluminum, special mild steel and fabric, therefore a *“motor mechanic” is the most likely to build it by 30K AUD maximum ready for flying and use* but the best “kit supplied” scenario of that aircraft is at least 50 – 60K AUD ! The 30K AUD model may be sprouting an extra or two without structural integrity compromise !

Oddly too, the aircraft model takes a 200 - 250 kg Lycoming or Continental of around 150 hp – 230 hp with a fixed blade prop, they are 25 – 30K USD reconditioned as good as new.

BUT, bitter-sweet There is an Australian (Jabiru) 120 hp (**underpowered with fixed blade prop**) 6 cylinder piston light aircraft engine , but weighs just under 100 kg, and costs NEW around 21K AUD, HOWEVER, **Variable pitch Propeller** (rated for the aircraft maximum load weight) and a suitable feathering blade 42 inch prop (**Startlock Angle - Feather/High Angle**) for around 6K AUD more will achieve the takeoff of a 200 hp fixed blade. On that model more forward weight is needed with the 120 hp to equal the io-360 or io-540 so **squeezed plate and rubber and plate bind at the base on partial fulcrum like pivot steel pole undercarriage** can be used with 26 or 29 inch Tundra tyres (bush tyre undercarriage). To gain enough forward weight to match an io-360 Lycoming.

Bearhawk <https://www.youtube.com/watch?v=1vxXDyHv2hw>

Zenith 801 4 seat <https://www.youtube.com/watch?v=7fUS1sbnIaQ>

Other <https://www.youtube.com/watch?v=QdNBa9v671I>

Zenith 2 seat <https://www.youtube.com/watch?v=IsQwAcvUAj0>

<https://www.youtube.com/watch?v=VQq2oYAwngY>

- **The benefits for Business and Leisure of “PPL Private Pilot License” and owning a light aircraft**
- Extreme reduction of risk of death by fatigue or accident
 - Only 1/2 to 1/3 of travel time by road (road vehicle is only 120Kmh max speed – 95 Knots with a STOL is 176 Kmh)
 - Increased business productivity and leisure quality and efficiency all round including as unemployed
 - More secure and flexible lifestyle by range of travel scope (less theft, lost property e.g. secure documents and less interference)
 - Less problems and re-flaring with historic personal physical injuries and ;ess development over time of new stress injuries
- **Extra info**
- National rail has a network system for freight all over Australia in various remote places and your car and caravan can be transported to a siding nearby locality to your destination airstrip and back!
- It is possible to have your own runway quite easily and simply on a small land size property (e.g. Hobby farm sized land) *

* Research shows that many “ordinary aerodynamic” light aircraft require around 250 meters take-off and landing roll that roughly equates to 20 acres of land as the “whole home property” to fit the strip into the acreage (not simply the strip and surrounding obstacle clearance requirements). HOWEVER, because Australia has neglected the first world responsibility of sensible transit method of light aircraft, **150m roll for a cheap STOL and heavy duty rough terrain wheels on 10 acres can be used to improve BOTH home strip and public destination landing area compatibility although with 4 seat they are often not made in STOL though some Australian light aircraft manufacturers do make STOL variant in 4 seat . (NOTE: 10 or 20 acre rural properties are subject to allowance with housing and building and use zoning requirements granted permits that generally are never changeable!)**

BOM Wind Roses (General) Wind Rose chart map Interpretation (runway direction layout)

- There are types of light aircraft variant can be found that may make it more possible to utilize the activity sensibly such as "STOL" and "Amphibian"
- It is possible to register your own home built kit aircraft as a "VH" registered light aircraft for PPL flight (NOTE: It may be a better scenario to have your factory built aircraft as a pressurized craft to be able to fly above 10,000 feet for VH)
- It is possible to gain add on accreditation with a PPL for “bad weather” and “visual night flying” “gas turbine with changeable pitch propeller” “STOL technique”

“tail dragger” “retractable undercarriage”

- Fuel costs approximately the same as a car “per destination to destination” (although aircraft fuel costs more).

[Link: CASA recommended syllabus Recreational Pilots License \("How to" control and "operate" an aircraft\) Also \(1st half\) standard part of the PPL](#)

[Link: CASA recommended syllabus \(2nd half\) Private Pilots License \("How to" navigate and manage flights and aircraft equipment "according legislation nationally" internationally recognised\)](#)

[Link: Other CASA Sample syllabuses for download](#)

NOTE: Because some aircraft are fitted for equipment for different conditions there are “four main mention” **aircraft type “flight rules” registered classification for the use of that unique individual specific aircraft** that match equipment fitted and constructed into the aircraft making it suitable for use in various conditions.

VFR Visual Flying Rules (ordinary daylight) , NVFR (Night “visual”), (IFR1 or 2 or 3 (Instrument flying control – various levels and licensed equipment e.g. GPS, 2D and 3D) and Bad weather (anti icing , hail , heavy rain).

The aircraft itself must be classified on registration for such purpose if approved after inspection.

Actual Fact: Private aviation is not feasible for the majority of would be pilots in Australia unless the aircraft used is a STOL !

It's one thing that there is no-where to take-off in Australia, so hence a STOL bush-plane, Bu' , You thought that was bad!

If you had an engine failure in a 4 seat ordinary light aircraft, there effectively is nowhere to land unless there is a deliberate runway, AND it would tend to plummet not glide !

A 4 seat STOL does have a small quantity of glide at full load capacity, AND can land on a short section of non runway ground with correct wheel / suspension type (heavy terrain) fitted !

Moreover the difference between an ordinary light aircraft and a STOL on non runway ground is landing or some form of crashing after engine failure !

Hence the 360 HP six seat mentioned below with fuel economy calculations and the other four seat STOLs !

Finally, don't bother with second hand aircraft, the Essendon Vic. twin Beechcraft "commercial company plane" that crashed into the shopping centre was over 20 years old, Australia is overloaded with old bits and pieces of flying aircraft and enough is enough, these newer tested but experimental designs are modern and built around learned advancements in many, aircraft beyond 5 years old are not a good investment in safety other than a good record on the individual craft !

Buying or building new will protect life not take it !

From the registry records of current VH aircraft in Australia , 70% of the list probably should be bulldozed into a trench hole no matter how well kept the past 50 to 60 years (and with one or two in it possibly 70 to 80 years) !!! Some of the funniest deadly crashes ARE immensely well kept antiques, BUT "amusing because" that won't be news to hear what happened (just waiting for that) whether a de Havilland Canada DHC-2 Beaver in the Hawkesbury River or a bizarre twin engine WW2 "era" vintage remote farm transport runabout suddenly didn't control properly and disintegrated ! It's not news ! It's simply "easily possible" what that will be after 20 years passes !

Reused aircraft means finding a pilot experienced with that design. Exhumation for purposes other than forensic examination is illegal !

G forces "Limits": (typical design aim)

<p>Standard light aircraft (Ultra light and LSA generally)</p>	<p>"-1.5 G" and "+4 G"</p>	<p>flown gently alike a commercial airliner (no sharp heavy turns or sudden movements)</p>
<p>STOL (Short take-off Short landing), light Cargo and Ag spraying/dusting unobstructed [Bearhawk four place] [Murphy Yukon] [Acrolite 1b]</p>	<p>"-4.5 G" and "+6 G"</p>	<p>flown with heavy manoeuvring at low speed and with heavy turning at low-flight speeds including sharp sudden powerful "recovery" actions (mildly acrobatically) [note 2 (PDF)] [note 3 (PDF)]</p>
<p>Agricultural and intermediate Ag or aerobatic biplanes (livestock roundup) [Skvote (PDF)] [Howland Honeybee H-2A] [Starduster Too SA300 (PDF)] []</p>	<p>"-6 G" and "+8 G"</p>	<p>flown with heavy and sharp manoeuvring at low flight speed and with heavy turning at low-flight speeds including sharp sudden powerful "recovery" actions (acrobatically) [note 1 (PDF)] [note 2 (PDF)] [note 3 (PDF)]</p>
<p>"Full" aerobatic and powerful Agricultural planes (crop dusters) [Air Tractor (PDF)] [Pitts S2C]</p>	<p>"-8 G" and "+9 G"</p>	<p>flown similar to WW2 fighter pilots in dog fights [note 1 (PDF)] [note 2 (PDF)] [note 3 (PDF)]</p>
<p>WW2 fighters and dive bombers (3t to 4.5 ton empty weight)</p>	<p>"-/+ 10 to 11 G" (5 G renders unconsciousness after 10 seconds)</p>	<p>NOTHING typifies the brute level of smaller single engine aircraft able to commit flight after damage and manoeuvre or travel at high speed without damage The following WW2 historic images typify the G-forces sustainable with an extra ton and a half of load on the aircraft above empty weight at speeds between 400 kmh to 600 kmh [JU-87 Stuka dive bomber crash (IMAGE)] [Small Yakolev fighter crash (IMAGE)] [Douglas Dauntless crash (IMAGE)] Rarely is a video a point, but at the end of WW2 fighter aircraft were no longer armed</p>

with machine guns on the wings, they were armed with "machine cannons" !
The following video of WW2 fighters being destroyed collaborates the immense destructive power required to destroy a WW2 fighter aircrafts' structure, and no mere high powered rifle bullets do enough damage, so requiring explosive heavy inertia cannon shells expended as a machine gun would !

A couple of short segments show what appears to be sparks all over the opponent aircraft, those in fact are "machine cannon explosive round strikes" but the opponent aircraft continues to manoeuvre operateively for a short time !

[WW2 fighters in action (VIDEO) at 2:20]

It demonstrates "the immense structure" of such single seat aircraft, albeit a severe evolution to that stage and 4 times the original size by the end of WW2.

[WW2 fighters in action (VIDEO) beginning half]

So, in short if you ever thought you could manoeuvre in most light aircraft the alike - your a madder lunatic than one of these and no excuse, which brings to mention a couple of kit / home build that are far in excess of most light aircraft structurally and only outdone by aerobatic designs or deliberate cargo (Murphy Moose and Bearhawk 4 place) !

The following two single person acrobatic biplanes are to note about manoeuvre,

		<p>"Acrolite 1b" weighs approximately 400 Kilograms with pilot and fuel but can only manoeuvre at +6/-4 G (Alike a Bearhawk 4 place)</p> <p>The single seat "Stolp Acroduster 750 too SA" weighs approximately 650 kilograms with pilot and fuel and can manoeuvre with a G force (+9/-9) of 3/4s of a WW2 fighter (+/- 11 G) , but can also carry another 220 kilograms extra ! "Stolp Acroduster 750 too SA" is the same size biplane as the "Acrolite 1b" but "Stolp Acroduster 750 too SA" is over twice the weight of structural material (and a steel frame) !</p> <p>Ordinary light aircraft are usually never more than +2/-2 G air-frame stress loading allowance during manoeuvre , e.g. Cessna 172 152. This is effectively the reason many "private agricultural pilots" get killed, unsuitable aerodynamics and unsuitable structure of the aircraft models design!</p> <p>Farmers should view the white outline box at the top of this page...</p> <p>Aerobatic Ag kit planes</p>
--	--	--

If you are under 30 years of age:

this, [Standard PPL "VFR flying rules" \(PDF\)](#), this [RPL 1st half \(.zip with .doc\)](#), and this, [PPL 2nd half \(.zip with .doc\)](#) are all you require to know for basic purpose, and, to read all this page too (light aircraft). Some of the other information aside is more choice to know (but probably an extremely good choice). If you are 30 years of age or older, consume / download everything, videos, documents, page links e.t.c. (with a fast internet connection) the two article site pages, their links, the "PDF Article (fatigue and distance travel)" and keep it all in a folder !

Too, icing conditions are common in Australia for at least a few months of the year, and at anytime of year daylight or night at some altitudes requiring watch(listen) of local meteorology reports. There are many Alpine like mountain range structures all over Australia too (Eventually the same "possibility" risk as Canada)

Snow (1) **Snow (2)**

ATSB icing event occurrence report (PDF)

"Presentation" Aircraft Anti ice methods (PDF)

US FAA icing conditions safety information (PDF)

Australian Airworthiness document - icing (ignore models "applicable:") (PDF)

Air

(while personal loans may be affordable repayment completed in 4 years at Maximum lent, NOTE (About "market cheap end" kit build systems): No home built kit light aircraft (almost all offered on the world market) is generally able to be finished under 60K AUD , mainly because an engine is 25-30K AUD "median" on top of the kit price along with 10K more for upholstery trimming and instruments extra , and sometimes paints whether internal protection metal primer and cover or external aircraft paint)

It may require up to three months to read all the information (download links and videos into a folder for later reading / viewing at will),

You will need to be able to view PDF documents and .doc :

required free DOC viewer editor download

and also may need an archive unzip tool depending encodings used by some sites

Winrar archiver (free version) download

required free PDF reader download

You will also require to download and study videos of particular resolution and information:

required free video "downloader" download

And if you do not have a good video player, this is one of the best free players (for most platforms and many codecs) called "VLC"

required free video player download

the links are all relevantly associate the information on,

reasons, logistics, PPL, cost, safety, kit type and acquirement, construction and other possibilities.

Google Chrome is a good browser for both link saving and web page saving.

Final note: Use an internet cafe to download any of this unless you have reliable high speed internet!

https://www.youtube.com/watch?v=iv_rRus-X9k

In the above video the information about "wing loading comparison between aircraft types with LSA" is "spurious" !

The problem he is referring to ultimately is **"*+/- G-forces loading*"** involving any of acceleration or deceleration or centrifugal maneuver force (the last rarely expressed in Nm Newton-meters of torque but in all cases in multiple 'units of 1 x Gravity" of earths value of acceleration)

The video information shows that "the structural integrity of an LSA is not as good with heavy operational load forces applied on it" compared a standard weight unlimited GA

aircraft of any size, and already in terms of safety, a two seat GA is less safe than a four seat GA , and **a four seat GA STOL is more safe than a four seat standard GA.**

The bigger the private aircraft, the better they handle standard VFR weather(meteorology) and are much less likely to ever be overloaded !

Four seat STOL is a high integrity level of structure and safety all-round in piston single GA because STOL are almost able to be flown in simple aerobatic level.

(About the following article) Why die of Fatigue in a driverless car?!

(NB: and why light Sport Aircraft (LSA) are not useful either ! - In Australian media news, "Ultralight" is near a synonym for LSA)

(and why an RPL at minimum to be able to safely hands on handle an aircraft and the PPL to make it useful in all ways)

(there are usually 10 or so compulsory personal and business journeys per year each over 300 Km distance one way, anyone has to commit over Australia's dispersed geography)

Between Sydney and Melbourne is 877Km , and around "8 hours and 43 minutes" by car (google map measurement) with revival stop at 100 - 120 Kmh.

Journey distance by aircraft roughly for purpose here, 740 Km between Sydney and Melbourne.

A general (ground roll take off - 120 meters or less) "STOL light aircraft" 90 knots 166 Kmh cruise speed, "4 hours and 24 minutes"

Standard light aircraft (long ground roll take off - 250 meters or more) cruise at 110 Knots 203 Kmh "3 hours and 36 minutes"

Mildly faster standard Light aircraft 120Knots 222 kmh (long ground roll take off - 250 meters or more) 3 hours and 18 minutes

One particular kit light aircraft has a takeoff roll (engine HP dependent) of 600ft to 800ft , cruise speed of 124 knots 230 Kmh, six seat alike a station wagon, near a STOL but not, "3 hours and 12 minutes"

Abberative fuel cost: (it is sensible to have "6 hours minimum endurance" in fuel tank size because of cost)

Buying "drums / barrels" or keeping a "bulk above ground tank" worth its size to the supplier to truck in can heavily reduce the price, but with a tank you need to decide the additives and or grade to store e.g. anti-water grade, winter grade e.t.c. to not mix it.

53.75 litres p/hour = 14.2 Gallons p/hour (**"6 seat-cargo" 360 HP piston - @ "3 hours and 12 minutes"**)* "not dissimilar" to 180HP O-360 Lycoming @ "4 hours and 24 minutes - SYD - MEL one way"

\$3 a litre (**360hp six seat gas guzzler scenario**)

total = \$3 x (3.5h x 54) = \$567

total = \$3 x (3h x 54) = \$486

\$2.50 a litre (360hp six seat gas guzzler scenario)

total = \$2.50 x (3h x 54) = \$405

\$2.00 a litre (360hp six seat gas guzzler scenario)

total = \$2.00 x (3h x 54) = \$324

~~*["4 seat" Standard STOL bush plane: 180HP O-360 Lycoming @ "4 hours and 24 minutes" \$370 fuel - SYD - MEL (fill the tank, I think this is it would have been a late night!!!)]~~

*["4 seat" Standard STOL bush plane: 180HP O-360 Lycoming

((30L x 3.5h) x \$2.00 p/ litre) = \$210

one way Sydney to Melbourne (120hp or 140hp engines and 3 blade Variable pitch Propeller is around 2/3rds fuel cost - e.g. \$150)

See about Avgas and UL91 unleaded engine models a page or two further...

Not cheaper than road vehicle, but what price your life when it's only 10 (to 30) times a year and some of those journey types(long distance) (if not all) always are the very substance of being in massive danger in a road vehicle !

@ 120HP it starts to be much more reasonable fuel cost and comparative to a car/station-wagon, but in a 4 seat STOL for fuel but it has "no actual engine power to add to (cooperate with) STOL design" although takeoff distance, and takeoff climb will only be "each extended" 1.5x - 2.0x the STOL model standard power distances.

The lesson, if you need some reasonable fuel economy in a four seat STOL then 130HP consumption is maximum to fit the cowl and finishing kit, BU' it is technically "around / thereabout" a minimum of around 160HP to takeoff a 4 seat STOL aircraft as a normal design. (below 180 HP not a good idea).

HOWEVER, IS THAT (fuel economy to engine size) REALLY A PROBLEM, when you use it only when required for long distance journeys !

Is it really a problem (fuel economy to engine size) if you use a 210 HP 30 times a year for distance journeys a year VS the normal ground travel vehicle around 700 - 800 journeys per year!

Is it really a problem (fuel economy to engine size) because the average 2 car family spends almost 20K a year to drive !

A pilot with VH registered and PPL must always complete a number of hours in controlled airspace and flight by flight plan and in terms of cost, MORE what would be difficult in this "light aircraft user scheme" would be to do the required number of reported hours per year usage to endorse the accreditation's legal requirements of holding the PPL, SO IT WILL NOT COST MUCH ANYHOW!

Finally, the aircraft will last at least 10 - 15 years with low hour rate on it by this "standard purpose" user scheme, so comparatively it is not like a car that is changed every four years on average.

note: **AVGAS** is leaded aviation fuel for piston engines (leaded or unleaded)
AVTUR is for turbines and jets, other names, JP8 or Jet-A1

Safe above ground storage of fuel on farms (PDF)

Water finding

link: (PDF) AVGAS and UL 91 Unleaded fuel - approved engines - (CASA - 003.pdf) Pump gas , mogas , 100LL , Ethanol , high octane "Engines"

link: (PDF) Lycoming UL91 approved engine models list

Various for aviation fuel: "Material Safety Data Sheet" (MSDS)

Lycoming web article about Avgas and unleaded in their engines: **links: [P1](#) [P2](#) [P3](#)**

Too, the same can be said of obtaining "aviation piston engine oil" as specified for the engine type and season, but more likely no more than a single drum.

With this last one (Canadian with 360hp engine), It notably has the point that if acquired factory built and imported and a hangar built for it on a private property with a set of new spare tyres, standard (Aus) instrument panel for "VH registration" (if you have PPL) and import costs e.t.c. that it may be 200K AUD on the mark.

Also, a note about that point, is with factory built you avoid "51% rule" of kits, makes lower insurance overhead, and at 200K that is the maximum a "helpful stable lad" average wage earner will be allowed risked by a bank "because "it" != real estate" (real estate == assured repossession value on default - bank cannot lose !

There are references to the three main types of airspace, uncontrolled (class "G" where most light aircraft are used) , controlled , and restricted. This last one (restricted) is generally military and secure government no different to the mine field surrounding some government military installations, if you breach that and step on a live mine, "what happens". Enough said, but remember "where" to use your aircraft and learn to fit and use "flight GPS" and "barometric altimeter" if you fly by any version of license so you can stay away from both controlled and restricted air space !

Preamble: (taken from the site index page)

This article endeavors to explain that there is a real reason to banter and protest "VH" light aircraft ownership should be acceptable and likely as a normal lower middle class activity and operation in Australia where possible and leaves no good reason for the allocation of near (if not all) total loan capacity to simply a house against prospective life earnings and because of the severity of Australia's environment that there is no good reason for personal/private expensive brand or model cars because of their inherent failure and impossibility of safety whether driven or driver-less at traversing long distances through the Australian environment because of time wasting, suffering and fatigue and the result whether expensive or cheap road

vehicle.

Moreover, That the pre allocation of life's earning for many considered stable and positive by a bank manager (at least after 25yrs age and in a stable marriage and work environment) was not properly examined for how to allocate the major requirements as the granted loan capacity can be dipped because of absolutely no understanding of the existence, use and cost of (PPL) Private Pilot License Training, "new"(probably home built kit) 4 seat light aircraft cost, hanger cost, *suitable real estate and location(size and obstacle congestion for runway e.g. 200m clear path(minimum for STOL)) cost and maintenance and operation cost.

*Of "suitable real estate", *Did you know* , if you buy rural land that has been granted a building permit for a dwelling in a remote area that has electricity supply lines nearby, *the allowance to use off-grid is not granted until* the cost of all the work and charges of connecting the network supply exceed something like 45K dollars (thereabout)! By law it must be network connected and the building permit may not be granted by placement potentially(if you do not put it as close as possible to the supply line then you must spend e.g. 100K or 245K dollars e.t.c. "whatever it costs" to run the supply wires and clear the terrain to put them through - e.g. 100 meters unobstructed costs vaguely around 30K dollars)! NOTE: That of other AKA "hidden costs" as example, if you were to buy and import e.g. a 4 seat CH801 STOL kit , it requires "international transport handling brokers" (if the aircraft manufacturer company does not "export trade deal CIF" (warning never use FOB unless you pay a foreign transport manager broker too – *nb*: ...costs too much!) to Australian port), Your method of pick-up from ACBPS customs area by a dock trucking transport company if you cannot wait around with a truck for the call from ACBPS(NOTE: must be done immediate of call) (suitable truck and suitable lifting equipment) all day for a week yourself, and finally there is either your DIY ACBPS customs "online import declaration over internet VPN with a personal digital certificate issued with ID sighted by Australia Posts' security desk" as "self customs broker" with payment of tariff (around 5%)+ GST(around 11%) (You can read "all you need to know to self import as your own customs broker" in the DIY Wind Solar Hybrid import article at <http://windsolarhybridaustralia.x10.mx/mainindex.html#monpaypers>).

Another vastly un-thought of point about personal loan cap is the fact that with some commodities such as a house (real estate) the extent to which banks grant home loan borrowing is unethical because of repayment factors they do not hold to account with the only method of sensible large unit money handling by thereabout average wage earner persons have because they cannot store vast sums of money safely by savings in a bank as "ready to draw" for security reasons.

Moreover, using more than 2/3rds of the loan cap may be with some banks the loan cap for a thereabout average wage earner if it is not real estate they wish to buy because it will not hold 100% value on default or called default of a loan! When a house or apartment is defaulted the bank repossesses and resells losing nothing and holding onto the paid repayments to that point! For the average stable earning "single" wage earner a home loan is generally 500k to 600k cap but sensibility prescribes because of other requirements and foresight that only 1/2 such a cap as maximum for real estate would ever be sensible for the wage earner to survive gradually gaining the proper tools to live e.g. perhaps a light aircraft , or, simply a year away for self paid retraining to be more employable which may need to occur repeatedly through working life to prevent default on any loans. What is built and financed by banks as investment in any level of locality where wage earners buy in terms of real estate is often calculated for "him and her loan cap together to the pairs max" as the final sale price of the newly constructed real estate and is as bad as bleeding dry because for most people to AKA

finance anything over 5000 dollars is too risky to keep as ready to draw and at risk as it is to lesser criminals that go more cheaply !

It also endeavors to explain the problems of geography, the environment and meteorology of Australia is for most worse than Canada and should be understood vastly Australia's light aircraft limitations though are much the same risk as Canada's, how so-ever it is perceived makes "the requirement for use of light aircraft the correct responsibly ethical action to be promoted to anyone" whom can achieve "VH" and PPL accreditation at the minimum level of accredited use achievement!

Since around 2013 the few Australian light aircraft manufacturers have produced kit and ready made aircraft somewhere around Australian average wage earner level of cost affordability (in the loan capacity context).

After over half a century, the harshest most extreme environment on the planet with as unrivaled "regular recurring" travel distances has not produced a world class light aircraft aviation industry or such a light aircraft suitable to compete the standard Australian family road vehicle, neither does its inhabitants understand the significance of having the tools to survive and operate within it in a first world or second world point of bothering to live in it as an ordinary citizen.

Probably its most perverse vulgarity of display in this genre are the lack of to non existence of take-off landing strips suitable for as much as twin engine light aircraft simply not supplied adjacent to each town nationally!

As any aboriginal has known for thousands of years, light aircraft are an essential tool to move around Australia without suffering and being killed in large numbers with road vehicles.

Oddly, the USA in 2011 had 139,010 GA (AKA "private") "piston" single light aircraft, but Australia may have only 40,000 in entirety of "aircraft" of "any type" and also usage/stipulation type purposes (business, private, heli, fixed or other), Australia should actually match the USA number (1/4 of a million total for GA) because of Australia's vast and harsh environment unlike the USA that is at least half European or Mediterranean by geographical and meteorological comparison.

Australia however, is extremely interesting for the lack of aircraft with its dispersed population areas and dispersed families across the continental land mass, of which is the harshest in the world , rivaling the storm factory north of its continental mass, but more than Mediterranean climate, a unique immense climate that has always claimed lives in any form of extreme weather, whether heat wave, winds and cyclones, freezing and flood and bush-fire (wildfire).

Oddly from this, one of the "most useful" stories of light aircraft incident with weather and terrain involves an oddly positioned section of land mass called Barrington Tops National Park in Eastern Central New South Wales.

Barrington Tops weather environment was used to train soldiers in its Northern half because it stretches from high altitude Alpine that in winter is sub zero at night and snows, all the way to semi desert (in the park) with rugged steep near vertical granite covered and formed hill and mountain terrain incorporating large tracts of dense jungle bush including rain forest and

in temperatures of the maximum humanly survivable (as not survivable) on the planet in mid summer!

Barrington tops is nestled in among two major military bases spanning 80Km x 100Km approximately, so when the charter light aircraft VH-MDX was lost in the middle of it (crashed) on August 9th 1981, it is not clear whether it was a military incident (only 9 years after the Vietnam war) of "restricted airspace" for which the government gives no explanation or a civil aviation disaster because of peculiar idiosyncratic weather actions (meteorological) and conditions (e.g. Lee waves and icing) or the failure of parts of the aircraft as the pilot had radioed before disappearing from radar never to be found!

The ATSB reports show a wealth of information on how harsh and immense the Barrington Tops environment is and was that evening VH-MDX disappeared but the subtlety is it is as harsh in many localized geographical areas all over Australia at some time in some season, and any other regions that do not have all of the weather or environment conditions Barrington Tops has, but always have much of the conditions in some way or another at some time of year.

That problem belongs to around no other place on earth except perhaps African countries that are not first world and have not the education or money to build, develop or fly aircraft, so are not a comparison for understanding "the trend" showing of light aircraft use. Neither is the USA a comparison because of this feature of weather and environment, but again too does not have an incentive alike Australia relating its wildlife by point of deadliness (It appears Africa has the only "comparative level" environment).

Australia's education levels are considered throughout time the equal of that of the USA and proves that by 4 Australian to 1 USA Nobel science prize recipients but cannot make a reliable, robust cheap enough world class aircraft to carry 4 to 6 people as a piston single with an industry to match from it developed in this extreme environment (that incidentally to this day, requires STOL and large wide landing wheels for light aircraft to be of use)!

Truthfully in 2018, Australia should be an odd and strange country by having as many if not more "piston single" light aircraft privately owned and flown in Australia as USA has number for number all GA! That's right ! 1/4 of a million aircraft "private GA" piston single aircraft and probably only around 10,000 commercial aircraft (maybe less) and maybe 50,000 private other types such as twin and single turbo prop. Again maybe as many as 1/2 a million to 1 million PPL and other "private" single engine or flight accreditation.

A quick look at "Canada in 1986" (since i cannot find the proper documents) shows 26,000 GA aircraft and around 4000 commercial !

The view of Canada 1986 is alike an identical view of Australia 2018 (30 years the difference), again, Australia should have many more private GA than Canada. period!!!

This view of Australian environment (not merely this 2009 in the links) however, is much more real than Canada

Roadside Vehicles (1) **Roadside Vehicles (2)** **Roadside Vehicles (3)**

It would have done well to understand its Geography and requirements for living in this country as much anyone that needs to traverse it.

Kit home build Helicopter

However, governments do not think in terms of assisting people only how much of a resource they can draw from somewhere to fill their economic requirements for their face values of success, their word is propagation not nurture until between the authorities and people the word to use by natural attrition becomes "help"(subtle).

Again too, some creatures evolved in Australia and have been handling its environment for a

million years or more

Natural environment of Australia

One of the biggest "jokes" Australia is to its national highway upgrades is the fact the immense money spent on "allocating" tracts of land to truck-Highway travel "fuel station kiosk and rest stop complexes" along major multi lane interstate highways has "no understanding of the significance" (theoretical) of allocating more land only 100 meters away for a solid twin length "one way" landing strip and light aircraft parking beside those types of stops with some rule of use development e.g. weather, parking and non controlled entry-leaving protocol.

Many features to help such areas now exist such as solar and wind off grid to power colored lights and runway lights for good weather NVFR that would be the maximum to use it and generally the maximum for most light aircraft pilots anyhow.

But as you can comprehend, Australia and its politicians understands nothing of the significance and purpose of light aircraft development and "purpose of use to supersede road vehicle", but particularly in the context of road vehicles for travel, the "impossible to be safe" and the context of "responsibility to promote and assist transition and continual use to a safer more useful efficient transit method" of which airliner is not a point finally and in many cases is simply a bloodsucker for many reasons against personal private life and business commitment.

Airlines are fraught with non voluntary cancellation, too small light aircraft airliners doing lesser routes as much require to be viable at finding customers and cost of delivering people, something that subsidy cannot cover for them viably from a government perspective. Weather being airliner's major concern for cancellation , a "personal owned private light aircraft" can often be utilized long before the weather reaches origin, any part of the track and destination by good forward planned and current meteorology and standard flight planning management and in some cases can have plan B at a field short of the destination and other arrangements for continuation over a short distance. With airlines there is no guarantee or flexibility of management or direct time efficient approach, particularly with airlines cancelling flights due to weather.

By good management planning personal light aircraft has massive advantage over airliners that often require the customer to make an "L" shaped journey over the map with their airliners destination exactly alike some road vehicles getting around large land masses 50km x 50Km or more to reach particular towns behind them!

Because of the way wages are locked up in reticulating debt on "house" and "vehicle" loan repayment based on 10 to 20 year credit risk capacity, it is more sensible to understand a light aircraft and PPL and hangar as being part of the whole capacity by down-marketing the vehicle and house to balance the loan repayment capacity system with the required costs for a PPL and aircraft and its requirements..

Flying is better for the environment and wildlife!

[Note: Interesting "aberration of real world calculation examples show"... "Average wage" in Australia of 2017 is around "\$1100" p/week
oddly too, "bank loan repayment" of "\$600,000 principal" through "15 years" at "4.5% interest" is around "\$1200" approx. p/week]

ARTICLE 1 =====

These two following articles are about speed and fatigue and the **12,000 total approx. a year hospitalised from road accidents** and the way out into the light !

<https://www.youtube.com/watch?v=eURrjDZgqm8>

Video remind you of your spine and pelvis from potholes in the roads off major highways after hours of driving?

*The Australian governments of past and present are a greedy SHAME to understand at no time historically or present did they promote **PPL Private Pilots License** to as many people as possible to prevent road deaths and to raise efficiency of business and private life in a country that is **NOT rivaled by Siberia , Russia , Africa or USA for distances** business people or families must travel in a single journeys direction each year regularly and often many times and often simply is not catered by airlines ! (Australia is the most dangerous and harshest environment on earth "habituated")*

*... "According to CASA, out of **36,000** Australian pilots, about 400 have colour vision deficiency and of those, 140 flew commercial operations" ...*

<http://www.abc.net.au/news/2014-06-18/colour-blind-pilots-licences-reviewed-by-casa/5531906>

*... "Australia now has **1.16m** millionaires, according to Credit Suisse's Global Wealth Report" ...*

<http://www.smh.com.au/business/australia-now-has-116m-millionaires-according-to-credit-suisse-global-wealth-report-20171126-gztc7u.html>

There are now 25 million population in Australia, and **around 8-12 million adults of around 6 million at very least are able medically and mentally to become a Private Pilot**, SADLY, only around 10,000 aircraft of "suitable type" exist in Australia for private use, but some are only used recreationally (**there should be somewhere near 1/2 a million to 1 million light aircraft !!!!**)

Australian designed light aircraft are smaller compared to USA systems (part of the shame -cost for supply and demand of something hidden from view), but a third to a half the time for the same distances by road travel makes them as good an idea as any light aircraft brand.

I drove the Hume Hwy in the 70's and 80's when it was a two way lane system and "violently dangerous" and extremely deadly, i believe i saw a fatal crash being AKA "cleaned" with multiple ambulances every 100 miles on average.

I have always known since a child that driving a car is more dangerous in Australia than faulty light aircraft will ever be!

On the Hume Hwy on average every 20 seconds a truck tray bed corner would pass within three inches of the driver side cabin structure uprights of the vehicle every 20 seconds at a collective combined collision speed of around 160 Mph (250Kph) for hundreds of miles (unlimited speed), there are scratches on the vehicles used that were the difference between continuing and "instant disintegration" in every direction for hundreds of meters !!!

(Day after day, year after year)!

It was my intention to fly as a private pilot when i left school because i came from a remote inland city, but never did because the government did not support that tax collection scheme scenario and there were few aircraft because of the recession and drought that followed over 15 years to around 2000 !

While major highways finally became better after the mid 90's other roads can never nor will all be multi lane p/direction and shows this feature of danger against light aircraft safety has relevance because of time by ground transport.

In the past few years (since 2013) cheaper light aircraft and aviation systems have become better and more affordable, "almost" down to single average wage earner level (a 'tis to) !

As you would expect, it is not dissimilar to cost of an expensive car (less - not the prestige cars - more

around dedicated 4WD - low end "token named" prestige) and a required legal competency level of "PPL(CASA - Private Pilot License) ["NOT" Recreational PL]" to "obtain the benefit edge in life-style from it", and what price your life !!!

https://www.casa.gov.au/sites/g/files/net351/f/_assets/main/lib100191/getting-your-private-licence.pdf

[just a point about PPL capability in Australia for journey or commute - <http://www.airborne-aviation.com.au/courses/night-vfr-rating.php>]

An interesting foreign ultra-light STOL example:

<https://www.youtube.com/watch?v=8wIe0ROnJVk>

<https://www.youtube.com/watch?v=YKSH2E51NV8>

[junk - Do for a soundtrack with it https://www.youtube.com/watch?v=8Akd_hAEeFE-]

Walk around:

<https://www.youtube.com/watch?v=ZIPrShenak8>

<https://www.facebook.com/zenithair/posts/1796513887030971>

This article is aimed more at "more stable settled down persons" whom simply suffer driving 10 times or more a year more than 200-300Km a stretch at the least, and never thought they could replace their system for what lighter weights of luggage they carry!

<https://www.casa.gov.au/file/139186/download?token=XtXcIPy9>

<https://www.casa.gov.au/standard-page/your-asic-questions-answered>

(Almost ALL the base information you need is in these two articles!

if you ever wanted a shortened way to understand an economically sustainable way to "not be killed on Australian roads", UNFORTUNATELY (while not actually complicated) IT IS around as short as can be explained with these two articles.

OTHER MAIN CONJUNCT ARTICLE - fatigue speed - light aircraft

https://www.facebook.com/permalink.php?story_fbid=1899689726985461&id=100008333560946

)

https://www.youtube.com/watch?v=3F8-steHs_k

<https://www.youtube.com/watch?v=5E22BzhMmuA>

https://www.youtube.com/watch?v=XWq_piIXgD0

<https://www.youtube.com/watch?v=UH3diaRX5B8>

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

note: *proper light aircraft are around 100hp or more, NOT smaller!!!

(speed and fatigue are the uncancellable factors in road death

- **SUMMARY it isn't done that way - you keep and fly a registered light aircraft (with PPL Private Pilot License for "controlled air space" AND must have "VH-****" civil registration type + X-spender) to "move distances beyond 3 hours ground road time" (pilot license-less aircraft must fly in uncontrolled airspace and cannot fly over (cross) a public road below - neither a RPL Recreational Pilot License go any more than 50 miles radius from where it took off)**

-

<https://www.youtube.com/watch?v=3Y7TCu0cMEs>

- **DID YOU KNOW (many light aircraft crashes are machines 30 to 50 years old)**

there are only around 9000 piston single light aircraft in Australia (in a population of 9 million adults and 6 - 7 million adults eligible (class 2 medical CASA) to be a licensed private pilot)?! - So its no wonder the high road toll, and waste of time Australian businesses are from lost secure information or wallet or purse not being at the meeting but at a police station - if they drive to keep it all in one place they around walk in as though they are drunk from fatigue the next day and under perform, as to being ..."you crumb you asshole godamit i never !!!!"...))

Too with young people, they are assumed at 17 to step into a car to learn, but Australian environment and

risk really means step them into a light aircraft to learn to get their PPL ALSO if you want them alive! : ("CASA - LEGAL LANDING AREAS" Link or google "92_1.pdf" - private e.g. a hobby farm)

<https://www.casa.gov.au/file/105066/download?token=aMdVb6EO>

CASA INFO

https://www.legislation.gov.au/Details/F2016C00540/Html/Volume_3

(note: Although basic small light aircraft fuel is 2 doll AUD a litre, the cost to fly a light aircraft Sydney to Melbourne is similar to car - though it only takes around 3 1/2 hours - with a 4 seater for children that's much nicer!)

The single Australian "AVERAGE WAGE EARNER" can handle cost of a factory built Australian light Aircraft on borrowing capacity "potentially"

(see **ARTICLE 2**)!

The cost of learning to fly "varies" between 14K to 25K but is mostly because of aircraft value in use for hire , landing and takeoff fees for particular airport and the insurance. Best done over a year by budgeting (or ASAP if you travel long distance frequently).

[The following PDF document LINK (although a private company info) has a good breakdown of "Australian Air space" classification (succinct)]

http://www.airservicesaustralia.com/wp-content/uploads/12-058BKT_Guide-to-our-operations_WEB.pdf

And here's some logistic safety for wind and parking check weather for a few days ahead if tie down is needed (and use a hangar for most!)

https://www.aagsc.org/members/aagsc_adm/UploadFiles/AAGSC%20RIP%20No%204%20Safety%20Considerations%20for%20Strong%20Wind_%20Incl_.pdf

"Australia makes a few light aircraft" two seat generally (and a couple of 4 seat) and are around 0.1 mill aud - 0.2 mill AUD (note: kits are often around just over half price of factory completed fly-away aircraft)

IT REMAINS UNCLEAR BECAUSE OF THE IMMENSE SWATHES OF CASA INFO (CASA - kits and "VH" rego (for PPL use - NOT recreational) and amateur built - <https://www.casa.gov.au/aircraft/standard-page/amateur-built-and-experimental-aircraft>

<https://www.casa.gov.au/files/021c04pdf>)

A FACTORY BUILT AIRCRAFT IS SUITABLE FOR (PPL) Private Pilot License LONG DISTANCE FLIGHT RANGE(ASK THE VENDOR).

<http://flysafe.raa.asn.au/constructors/buyandsell.htm>

Next link is a "Jabiru kit construction manual (PDF)", it happens to miss two crucial point on "page 20" for "industrial OHS",

A. when cutting "fiber glass" and alike "dangerous dust" you should have a cheap "industrial vacuum cleaner nozzle operating" near the cutting activity to help take away that type of dust (its only mentioned with an angle grinder) apart wearing an "anti-dust ventilator mask".

B. With epoxy, wear a "fluid proof(water proof) synthetic leather industrial workshop apron" over your front whether you have overalls or not! The epoxy can be spilled or drip while you are in some positions.

Of either epoxy or dangerous dust types particularly if dust is from a power tool , eyes can be sensitive to epoxy fumes at close range so proper sealed wrap around eye protection goggles should also be worn not merely safety glasses!

C. Some of the following kits use pop-rivets, they can easily be mis-installed. Always "hold the two surfaces together perfectly" at the rivet hole, and always press the head of the rivet-gun firmly to hold the rivet in the hole "while" squeezing the gun handle. Not doing this altogether at the one moment often causes a loose rivet and loose flapping surfaces and eventually failure of the binding. With a fiberglass surface , the opposite side "should have a metal washer for the other end of the rivet too distribute pressure on the fiberglass without shattering or sinking in it!".

<http://jabiru.net.au/Manuals/Airframe%20Construction/Jabiru%20J160%20Constructors%20Manual.pdf>

LIST of kit manufacturers: ---

(ALWAYS ASK IF IT CAN BE BUILT and "VH-**" + transponder (24 bit) registered for long distance cross country flight with a PPL)**

Jabiru 230-D can be fitted for Visual Night Flying

<http://jabiru.net.au/aircraft/j230-d>

Australian Lightwing Hughes 2 seater SP2000

<http://www.lightwing.com.au/light-sport-aircraft/>

SP-4000 (pdf)

<http://www.lightwing.com.au/pdfs/SP2000SP4000.pdf>

ALW Hughes six seater (kit aircraft) 6000

<https://www.northernstar.com.au/news/ballina-ultralights-not-ultra-expensive/751916/>

Brumby Aircraft

<http://brumbyaircraft.com.au/brumby-610/>

<https://www.youtube.com/watch?v=S1DRPj38gGk>

<https://www.youtube.com/watch?v=WAJ-ofkyfEI>

<https://www.youtube.com/watch?v=Bst5bFSqXkA>

<https://www.youtube.com/watch?v=aReYq1cAPzM>

<https://www.youtube.com/watch?v=bmiFFT--wkI>

<https://www.recreationalflying.com/tutorials/navigation/wind.html>

Foxcon Aviation Terrier 200

<http://www.foxcon.com/>

Morgan aircraft

<http://www.morganaeroworks.com.au/Cougar%20Mk1.html>

Aircraft kits Aust.ralia

<http://aircraftkits.com.au/about/>

<http://www.aeropup.com/>

safety: ATSB info https://www.atsb.gov.au/publications/investigation_reports/2013/aair/ar-2013-107/

Other

<http://www.zenairaustralia.com.au/ch-750-stol.html>

<http://cubcrafters.com/carboncub>

<http://www.gap.aero/>

http://www.planeandpilotmag.com/article/2016-light-sport-aircraft-lsa-choices-galore/#.WWbf_et95Hc

<http://www.australianflying.com.au/videos/friday-flying-video-sling-4>

<http://www.aerotrek.aero/>

US light aircraft

This is a four seat Cessna around 0.3 - 0.4 mill AUD

<https://www.aircraftcompare.com/helicopter-airplane/Cessna-172-Skyhawk/142>

Maule air has a four seater <http://mauleairinc.com/>

<http://www.maule.com.au/taildragger>

<http://www.airplanefactory.com/aircraft/sling-4-kit/>

Fatigue Speed – PPL and light aircraft (ARTICLE 2)

=====
This article is about Road speed fatigue fatality (harsh environment - excess distances - overtime), 12,000 hospitalised p/year by road accidents....

https://www.atsb.gov.au/media/625511/AR2007043_1.pdf

note: *proper light aircraft are around 100hp or more , NOT smaller!!!

(with PPL Private Pilot License for "controlled air space" AND must have "VH-**" civil registration type)**

https://www.atsb.gov.au/media/625511/AR2007043_1.pdf

(CASA – kits built light aircraft and "VH" rego (for PPL use - NOT recreational) and amateur built - <https://www.casa.gov.au/aircraft/standard-page/amateur-built-and-experimental-aircraft> <https://www.casa.gov.au/files/021c04pdf>)

(pilot license-less aircraft must fly in "uncontrolled airspace" and cannot fly over (cross) a public road below - neither a RPL Recreational Pilot License go any more than 50 miles radius from where it took off)

<https://www.youtube.com/watch?v=3Y7TCu0cMEs>

[This is a long comment article: In summary the only method of beating driver fatigue (and not speeding in one of the only harsh countries on earth (**FACT: "Australia is the most extreme harsh environment" on this planet !!!**) **in extreme conditions** - Only USA-Canada and some countries of Africa and Russia compare for STANDARD vast excessive ground travel distances) is flying a private light aircraft at 110 Knots speed with a PPL Private pilots license (with PPL Private Pilot License for "controlled air space") and a set of post license accreditation for craft-types and flight situations !!! The mentioned economics may be reasonably sensibly handle-able by borrowing capacity for an average wage earner at the bottom end of its market with an Australian four seat kit - but what price your life (It may be safer to DIY than driving on the road)!?]

https://www.aagsc.org/members/aagsc_adm/UploadFiles/AAGSC%20RIP%20No%204%20Safety%20Considerations%20for%20Strong%20Wind_%20Incl_.pdf

Having a PPL Private Pilots License and plane eliminates many travel problems.

Govt. budgets or not, in the past 40 years nothing has cared to realize this continent is no different to Canada for expanse and its safe operation IS NOT by roadways, Australian trucking on these new modern upgrades are no different finally to the "Ice road truckers" of Canada.

To not subsidize PPL and aircraft to ordinary people and promote it is murder by a selfish government bent only on thieving tax sums.

The only sensible method for Australian travel distances to beat "DEATH BY DRIVER FATIGUE"(and for easier child handling) is a PPL private pilot license , it allows you to fly aircraft with six people up to **80Knots/h (150Kmh) (100Knots is minimum to seriously beat fatigue** driving over long distance e.g. 5 hour car drive is around vaguely two hour flight) speed and can be extended with training to Visual night flying and aircraft faster than 80 Knots.

The Australian government are immense creeps for not subsidizing and helping all able bodied (class 2 medical CASA) people to obtain a PPL with these extra license credits, because "it is the only way of beating fatigue", truthfully it requires private light aircraft for personal passengers in this country of at least 100Knots/h or more (nominally 110 knots cruise speed specification) to traverse the required business and personal distances in Australia. Driving not flying with your own private license and light plane people will continue to be killed in vast numbers of which half were not responsible for any of the problem !

Moreover, people need to use these things to cause the price to go down in swapping to supply and demand to common offer to make pricing affordable. Its too locked up in snobbery and restrictions and cost.

Of cost, if you are starting a home and getting a home loan and can afford a 600,000 dollar house , you can probably drop your housing aspiration back by 100,000(or 250,000 for a new light aircraft plus its keeping reserves) with a 600,000 dollar loan then after talking to the bank manager use and keep 100,000 to use 20,000 to visual night flying and over 100knot license , you have 80,000 to but a second hand aircraft for travel and job-business canvas geographically.

But it flogs the whoop from dying various complex ways by road vehicle travel that are often not there to a light aircraft continuously !!!

No dangerous unknown passengers, no crippling cramping, no lost property, no stolen property, reasonably available on time dependent weather (there is a "bad weather accreditation license add-on").

New light aircraft at the bottom of the range (USA e.g. skyhawk standard , warrior) are around 0.2 mill but many 10 to 20 year old that have passed SIDs can be gained for 0.1 mill

In the past 10 years, ordinary light aircraft at the bottom of the cost range as 2 or 4 seat can cruise at around 110 Knots (200 Kmh) (126 mph)

Meaning, If you left in a car from "Sydney to go to Melbourne" at 8:00am you would be at Yass NSW(faster aircraft - e.g. 120 Knot cruise) 300Km or Gundagai NSW(slower aircraft - e.g. 110 Knot cruise) by 11:30am progress going into the truck stop to get a brunch coffee and stretch your legs, and the light aircraft would be about to call to join the queue to land (11:30am) at Melbourne. As too from Melbourne at 8:00am by 11:30 is Albury on the NSW VIC border, and the light aircraft would be ready to queue to land at Sydney.

--- This section is a little contentious to add to a post elsewhere....

An Australian "single wage earner loan" BORROWING CAPACITY "EXAMPLE ONLY"

of 400,000 dollars ,

can have

ongoing fee pa. \$400

repayment over 15 years

of \$2900 p/month (\$725 p/week)

THE GOOD NEWS

A modern (produced 2015/16/17) new light aircraft has a very(extremely) high re-sale value within 10 years use (the reason for buying new or the system would not operate well in a finance loan) !!!!

Your bank would not be particularly worried if you had a PPL and/or also the extra accreditation set (bad weather, VNF, over 100 Knots handling).

a hangar, and insurance and costings(craft,tyres,training,service,hangaring,odd-bod-electronics-that help) to 250,000

NOTE – MONEY MENTIONED HERE IS A "TOTALS GUIDE ONLY" (SOME IDEA OF THE TOTAL CRUNCH!)

The bad news (It's massive money juggle and at base variable loan for aircraft hangar house and car and PPL approx 550,000 over 15 years loan),

Your house and car are around the other 150,000, a town outside a city (is that so bad).

In short, mainly you would borrow 150,000 first to buy your home, and keep your loan capacity level , then, after gaining a PPL would then hand the financing deal to the same bank as per - perhaps agreement foreseen with the origin loan.

Final point! Do not allow your insurance policy to lock it up against its usage, THAT IS WHAT THE AIRCRAFT IS FOR - to go long distances up to 3 - 4 hours at/over 110Knots, do not allow either Insurance or bank agreement to prevent shorter hops (particularly mountain terrain hop over to avoid) or practice once every two weeks to a month.

While the population around 1970 had 128 p/100,000 fatality on roads and by year 2000 after the redo into proper 6 lane highways it went to 4.1 (four point one) p/100,000 statistically,

Some 12,000 people or more approximately a year are "hospitalised by road accidents every year" !

Driver-less car or not, it is too far too long in journeys over 300Km and it never hurt anyhow to use such a device (light aircraft) between 100 - 200 Km to nearest major town or city with some ground transport pre-management.

Roads waste lifetime!

<https://www.youtube.com/watch?v=WAJ-ofkyfEI>

<https://www.finder.com.au/australian-families-transport-costs-soar-higher>

<https://www.brisbanetimes.com.au/national/queensland/brisbane-households-spend-19000-a-year-on-transport-report-20170522-gw9xvi.html>

COMMON AIR CRASH AND PREVENTATIVE SAFETY

The following "news article" has two of the most common reasons for Light aircraft crash in Australia (1) Flight planning management and two (2) fuel.

Home built (piston single) Light aircraft test flight crash, HOWEVER, bad Flight planning management most commonly causes "collision with terrain (in many ways as a broad term)" through bad or insufficiently planned practices of flight path, of one of these being "overhead lines or wire-strike"!

These two ATSB reports typify the 3rd most common method of light plane crash (3) "loss of control" (**stall** - low air speed - low altitude)

a. **Loss of control** (PDF download page)

b. **Loss of control**(PDF download page)

ATSB 2016 Austrian flight safety information media release

Most of the aircraft that crashed in 2017 (much media release coverage) were far over 20 years old!

In this document (following link) can be seen the "main" or common cause of fatal air crashes is "flight management planning" and second most common is "control handling operation", the last significant statistic in bulk killing is "bothering to or how to respond to emergency" ! Any questions why it is sensible to get training and VH use accreditation with PPL "*not RPL or simple us of uncontrolled airspace*" !

Statistical fatal air crash cause breakdown CASA-ATSB (PDF)

Human factors in Australian aircraft crashes - ATSB (PDF)

Low level flying - ATSB (PDF)

Collision with terrain anomalies - ATSB (PDF)

Ordinary Visual license pilots in wrong meteorological conditions - ATSB (PDF)

Government issued warning - starved and exhausted

..."*Ground-based animal strikes were relatively rare. The most common ground animals struck by aircraft were hares and rabbits, kangaroos, wallabies, dogs and foxes. Damaging animal strikes mostly involved kangaroos, wallabies and livestock.*"...

Bird and ground level "wildlife and animal strikes" stats info (flightsafety - article abridged)

Bird and ground level "wildlife and animal strikes" stats info (PDF report ATSB)

This document from

<http://windsolarhybridaustralia.x10.mx/>

<http://windsolarhybridaustralia.x10.mx/light-aircraft-ppl-vh.html>

Things they didn't tell you (particularly unlicensed in uncontrolled air-space)

Use of the simplified geometry rules of "right angle triangles" and "quadrant (circles)" can almost allow safe take-off and landing on air-strips unknown to a pilot and by mental arithmetic.

Rule 1. The square of the Hypotenuse length, is equal to adding the squares of both its base and its upright sides together (of a right angle triangle only).

Rule 2. The angle of ascension of the Hypotenuse when the base and the upright side are both equal length is 45°

Rule 3. Therefore (theoretically as an example of a powerful engine light aircraft model to weight to power), from Rule 2, An upright side of half the base length is 22.5°

22.5° (* something like) is the maximum climb angle many load carrying average piston single engine light-aircraft have upon leaving the air-strip, and if trees are 50 meters tall (at the end of the air-strip) such as some very old Poplar tree species or other tall species of tree. To hit the absolute top of the trees unsafely will mean leaving the ground 100 meters (2x the "tree height" because the upright side (trees) of a right angle triangle is half the length of the base from "the point on the the ground where the wheels leave the ground theoretically back from the trees"), so it requires another 100 meters further back plus the origin 100 meters 100+100 (really only 100+50 further back) for the aircraft to leave the ground AND must also add aircraft model and weight requirement take-off roll distance (to be judged by the pilot) to give the aircraft correct takeoff speed for its weight before leaving the ground 150 - 200 meters from the trees. This gives the total ground-roll and climb distance FOR IT TO HAVE SAFE CLEARANCE OF THE TREES.

In summary, A light aircraft of properly powered STOL or a high end engine power fitted of model version light aircraft can takeoff at 22.5° (2x obstacle height as the moment of lift off minimum point 2:1) , A median engine powered model can take-off at 15° (3x obstacle height as the moment of lift off minimum point 3:1) , a low engine powered model or ultra-light / LSA at 11.25° (4x obstacle height as the moment of lift off minimum point 4:1) PLUS ground roll distance of model for current weight PLUS an extra 20 yards for powerful engine or STOL light aircraft and extra 50 yards added for low power light aircraft.

1. To see through the wind screen you will need to have a working demister whether summer or winter, weather and temperature do not operate the same way in the air as ground level dwelling !
2. Learn the mechanisms for delivering air to the cabin and their control position status and serviceability in any aircraft you will use or you could suffocate or become delirious and crash !
3. Most small light aircraft have "flaps" but some do not ! MOREOVER than that, flaps have the problem they usually have a few different level settings at least. This means that to properly and safely land or take-off you need to know the exact speeds that should be used as both minimum and maximum "for each setting level of the flaps". If you do not know these for the exact model

of aircraft you use, unless you are very experienced you have a huge probability of crashing. The aircraft must maintain a tight band of correct speed for each flaps setting level !

4. Pointing the nose of the aircraft with the compass bearing you want to travel does not mean you are flying / traversing straight toward your destination, you can be drifting off course from cross wind. You need to setup your point on the horizon visibly with the compass bearing then switch to visibly heading to it without deviation of path for 5 minutes or so before re-checking the aircraft continues to head in the correct direction. So the centre static notch for directly forward on the outside of the compass body only tends to be showing how much "yaw" of the aircraft is occurring not the actual bearing when visibly heading toward the point on the horizon used for checking by watching there is no drift. At night you would continually realign up with the position of a star on the horizon every 5 minutes but **MUST REMEMBER** stars in the night sky "rotate through the sky as the earth spins"(subtle) out of place so you cannot simply re use the star again and again, you must find a new star or position suitable for stable alignment with the compass bearing then check the drifting off the bearing course for wind and re-align the flight visibly. (Hence having VOR equipment fitted and understanding it or nowadays GPS at least)

5. Engine speed does not operate quite the same way as a car, because of propeller structure the engine revs are accelerated sped up slowly and brought down slowly by moving the throttle slowly, there is generally no "acceleration port for rich fuel induction into the carburettor" for sudden engine speed and power increase unlike a petrol vehicle. When the prop is accelerated in RPM it is under massive stress that is almost irrelevant to the centrifugal forces of the spin, the acceleration forces are a completely different direction and not a safe to commit by massive sudden power, hence no acceleration port and requirement to increase rpm slowly and decrease rpm slowly.

6. The propeller speed is usually around 2700 - 3000 RPM maximum , some are structurally made to withstand higher rpm some are not. Most aircraft engines are straight through drive train so engine rpm matches prop rpm usually.

7. If you buy a light aircraft that is not a STOL you will need around 300 meters (984 feet) to safely land and take-off.

8. When bringing the aircraft in for landing, whether there is a fence or open space AND fence, to not impact wheels on the fence and crash, if the fence is near the end of the runway requires **TWO PRE SETUP ACTIONS**, a. aiming for the touchdown point on the runway 50 yards past the fence line, while simply using its height as a "mesh compound fence" (usually around 2.5 - and as much as 4 meters) b. travelling toward that point physically directly from at least a couple of hundred yards and from at least 100 - 150 feet altitude as starting point in a straight line that is also a very shallow dive of the nose toward that point 50 yards past the fence. * The split second moment the fence is past/passing the aircraft pull the nose up to normal horizontal flight quickly but gently (You should travelling low speed with full flaps , unless there is a strong cross-wind that will require faster flight speed and a less resistant flaps setting level) For most, the whole point is to both pass the fence safely and be travelling at a speed that maintains flight and control to prevent aircraft altitude sudden sinking by a sudden tail wind gust or sliding from a heavy cross-wind gust of either of these could catch the wheels on the fence extremely unreasonably, but there are no second chances ! (note: when pulling to horizontal flight the height of the above ground from its' wheels should be at least 10 feet , and when an

aircraft changes direction it loses some of its flight aerodynamic effectiveness and speed so may need a tweak more power to prevent descending too fast although subtle at that point).

9. A light aircraft cannot descend like a jet liner and cannot contact the ground when landing as violently a vertical speed of descent as a jetliner, A light aircraft should ALMOST be flown onto the runway because it can only descend onto the landing strip at a speed of no more than 3 feet per second maximum to not be committing some form of nominally hard landing, In any case (or however) while they can take heavier it is best to save the hard landings for cross wind landing when the aircraft "must land" for safety reasons of not continuing flight.

10. Piston engine AvGas and standard car fuel are very similar, however, in Australia it is a good idea to use engines set up for ordinary car fuel of a particular octane level if it is a STOL.

11. While aircraft manufacturers tout extremely short takeoff and landing runs with STOL planes, they have much longer take-off and landing runs at "maximum take-off weight" as "fully loaded"(fuel + persons + cargo). The heavier loaded the aircraft is the faster it will need to be travelling to take-off OR land, heavier requires higher speed and longer runway, lighter requires lower speed and less runway length. * However, strong cross winds require use of greater speed for take-off and landing whether light weight or fully loaded (* also note practice and experience with crosswind can be gained in a safe wide non dangerous environment close to ground level)

* Australia has an idiosyncratic form of cross-wind common to it, called "sawing wind". "Sawing wind" is wind that blows for brief short or prolonged gusts of seconds long then ceases blowing for a few second then repeats the brief short or prolonged gusts of seconds BUT COMING FROM THE OPPOSITE DIRECTION !

Sawing wind is generally not 180° opposing , more, 120° offline to opposites to 150°.

12. Never put an aircraft into a spin unless you have been trained, much less an aircraft with a short fuselage.

13. Always carry extra fuel 30 minutes beyond the time required for the complete duty of the quantity implemented. Not merely head winds causing high fuel consumption, BUT a blinder ! Restricted "NO-FLY zone" air-space can be assigned by government at any time a without warning and notification, the only warning is a "government forces" aircraft in-signifying as a directive of authority by its presence for your aircraft to change course and to use a particular route (always carry a mobile phone and 477 Mhz UHF-CB hand held 5 watt). Some people paint "things alike" *UHF-CH23* in small letters half the size of what would be registration fonts on the side of their non registered aircraft (means 477MHz UHF CB channel 23 is listened into in the aircraft)

14. After slowing after landing (and slow enough to turn without tipping or when losing flight control from low speed after slowing after landing) or while taxi-ing in heavy wind gusty conditions particularly , if the aircraft is being blown over point the aircraft nose away from the wind (back/tail pointing into wind) and keep upright with ailerons by using OPPOSITE control stick movement for ailerons. (various aircraft model instruction manuals show or tutorialise ground handling movements)

!!! -w One great safety point to note about the physics of flight: **Always land into or across the wind direction.** This person in the news link has given everyone

a first hand lesson of WHAT and WHY, **WHAT:** He crashed in a simple touch and go manoeuvre at an aerodrome and found his aircraft nose being pushed down toward the ground after lifted off the runway "**at low landing speed and (as would be) with flaps down**", **WHY:** "when the wind from behind directly or in a sweep of 90 degrees either side is blowing or "gusting" faster then the aircrafts' speed the aerodynamic control surfaces cause opposite movement responses on the aircraft, (includes flaps as can be seen in the picture in the article) This is important because a STOL is extremely re-active at low speed and a home airstrip may not be particularly more than 150 meters long and clear at either end. SO, you thought take-off was dangerous over trees with only one end clear. The only solve to landing with a tailwind is to put flaps down as "minimum setting" and fly onto the runway at twice the full flap minimum landing speed using nose up attitude to mimic flap resistance by feel (control experience by the pilot) of this will require every piece of runway possible and likely at least 150 meters with these 4 seat STOL in the article when fully loaded.



ABOUT KITS

WARNING about the meaning of the word "kit" and totals "look closely" "examine carefully" (NOTE "TOO" with International freight NOTHING IS EVER FREE)

(anyone kit set requires other kits to finish it, an aircraft is in sets for sections of it)

Moreover "wiring and instruments" are almost a separate non supplied to any manufacturer and not part of any pricing shown by any manufacturer! (5K AUD for instruments for use in non controlled air space only is easily the max - paint and painting tools is around another 1K, ordinary tools can be around 1K, transport of kits "from Australian ports" can be up to 3K)

Moreover again, "making a hangar first" means having the land size location situation and requires steel welding and concreting to construct a gale force proof hangar (a few of feet higher than the highest possible point of the aircraft -re tail-dragger propeller and a couple of feet longer than the longest dimension of the aircraft)!

One other feature is "construction degree of difficulty" , some are almost materials and plans , be sure what your total expenditure and kit "sets of" checksum will finally produce after searching and choosing to buy 4 seat kits (4 seat are usually too heavy to be LSA but 4 seat is what you need for viable useful remote kept "VH" vehicle or remote home or difficult access home) !

Just a quick note! If you ever get an aircraft, "ground handling" on a windy day is required to be understood, there is a quantity of carefulness and control use to prevent light aircraft from tipping or being knocked over by wind gusts !

They do not simply stay upright because you're on the ground!

Always commit "tie down" with the tie down links the moment not in use, and park it directly pointing its tail into the forecast and present wind!

The investment would be too huge to lose!

*** (Important) Aircraft fuel systems: it is suggested that you ensure your fuel tank has booster pump and the carburetor system (whether "actual carburetor" or "fuel inject air inlet throat") has heating system, too, fuel injection is a better safer process than "actual carburetor" - carburetor heating (so**

called / named) is used on the air inlet on fuel injected systems not simply carburetors to prevent ice forming if conditions such as that occur !

Link: Important - read this US FAA fuel system requirements (PDF)

"Actual carburetor" has a fuel bowl (relating gravity - just like a soup bowl on dining table) with a small quantity of fuel in it that is fed to the air inlet by suction. "Fuel Injection" (AVGAS or ordinary car fuel) has an injector nozzle protruding into the air inlet "so called" carburetor throat suction stream with electronically metered pumped fuel but suction does not actually deliver any fuel and fuel is not exposed to gravity and aircraft angles during injection, only the fuel tank is exposed to these circumstances that can cut off fuel !

Link: Aviation Carburetor online presentation

Link: Basic carburetor induction system

Link: FAA USA Aircraft power plant detailed introduction (PDF)

Link: QZ and A One more feature to remember to ask the manufacturer, is whether both "anti-ice system" and "carburetor heat system" are supplied as standard systems, "they are actually quite required" in Australia!

Large STOL wheel "wide / large tyre" rough terrain undercarriage is also a requirement because Australia has few non VH ordinary kept landing strips and if everybody read this and bought aircraft it would probably not be until year 2025 the government would see need to move its fat lazy butt to put in more uncontrolled landing strips! Presuming Barge Arse assesses it.

Link: Kit twin engine example(kit) (Velocity V-Twin 4 seat)

Link: (Velocity V-Twin 4 seat) News Article (1800ft - 500m ground roll)

Link: Kit (Velocity V-Twin 4 seat) specs (PDF)

Link: AeroCanard kit Single engine example(kit) FG (or RG) 4 seat (nb: too long a take-off roll for Australia)

[PREVIOUS MENTIONED *Velocity twin* IS SIMPLY TO SHOW AN EXAMPLE OF A KIT]

The following (chipper) is ONLY noted here as an EXAMPLE

of the mildly fiddly nature of putting together an aircraft from kit and not much relevance except understanding its facets to examine carefully in documentation and costing, Belite is much more suited to aerial mustering not as a light aircraft.

Link: Here is another two seat kit STOL "Chipper" from a US company called Belite for around(finally) 50KAUD (i have found a web page on the net that near misrepresents Belite and the aircraft as Autralian)

Link: Here is the Belite "Chipper" kit acquirement "sets" pricing list break-down, i don't wish to bother here with two seat documents info much to make example of the complexity of how obtaining the parts is, but the document (PDF) is cleanly written and displayed and a good introduction if you bother to view it

Link: This parts listing document description (PDF) for the Belite Chipper is a good "introductory view" also

You need to be aware,

"Kits almost invariably never have any flight instruments or flight instrument parts, and no engine", kits often (usually) are in two to three separate "kits" , meaning, main body and packages, or main body - packages and wings.

Then often another "separate" kit to buy for it called a "finishing kit" (sometimes called "Firewall-Forward kit") - the nose cowling matching the engine and its structural engine mount

frame

Control linkages and *matching propeller system* altogether.

An initial "complete set of" totals (sum of the parts to make the whole cohesively matching) is the bare minimum to build.

Always understand what you require to order and the total will be for what you pay to have a "complete" aircraft to finally construct and fly! (USD , AUD or other currency to convert and pay and also shipping cost along with terms such as CIF (shipping insurance is a good idea)).

Link: (STOL CH-801 4 seat) Here is a perfect example again of how "kits and types" are broken down into "sets" and "options" and those sets sometimes may only be relevant to some countries (look for the words "NOT INCLUDED"), moreover, it seems there is not much mention of where to get cockpit instrumentation, but can probably be modeled for Australian requirements from a Jabiru "VH" suitable type such as J430 4 seat

Link (PDF): Jabiru J430 kit sets parts list see: "Standard Inclusion"-instrumentation (note: "a" VHF radio is Australian "air band" GA spectrum)

Link: Zenith instrument kits

Although it may be thought that with the "finishing kit" and other "finishing parts" there is a propeller (depends whether it is a separate item and usually is for special reasons, choices),

[Link: \(article\) Bearhawk Propellor](#) (fixed blade)

NOTE: Variable pitch Propeller (not propeller governor)

[Link: \(article\) "propeller governors" \(Constant speed Propeller\)](#)

[Link: \(PDF\) "propeller governors" \(operation\)](#)

"Propeller governor (use it on an slightly underpowered piston single engine"

It is a good idea to understand that there is better efficiency from some propellers such as "three blade", for example, the Murphy moose is actually sold with two blade and wide bladed more modern prop blade design, but for such as Australia better efficiency and takeoff power usage a three blade is more of a "must"(where possible).

Apart aircraft "fitting" , choice of another propeller is a "must" for Australia to reliably take-off shortest every time and cruise when harnessing the engine power.

Propeller "diameter against undercarriage suspension movement ground strike" and "weight" are the two main limiting factors in obtaining a different propeller, but it is best to account your economics for using "at least a three blade propeller" for any light aircraft you buy (never two blade if you can avoid that somehow).

Some two blade propeller systems are more efficient than the older standard two blade design and it is best to understand if these are actually suitable on any aircraft because of the need for Horse Power harnessing for efficiency.

Note: Other "parts" often **not included** are "exhaust system(has to fit the engine to be used)", "undercarriage method type and fittings", "tyres", "brakes", "cowling(has to fit the specific engine to be used)", "engine mount(has to fit the specific engine to be used with the

aircraft model constructed)", "manifold type" (has to fit the specific engine to be used) – "anti-icing manifold system" (has to fit the specific engine to be used and the anti-ice system fitted), "accessory fuel tanks", "accessory underbelly carrier box"

To be sensible at explaining and help here, normally a STOL kit for 4 seat will be standard around 120(max is really 130) to 150(is not quite) meters takeoff distance, here's a USA kit with the same types of point of broken down "choices of sets" or "pure plans"(warning, but adhere to materials specification) can be used.

Link: Bearhawk 4 seat kit aircraft (Original "A" standard 4-seat model – 200 - 500 ft roll modifiable to a bushplane – note: Model Bravo is a 4 seat STOL + bushplane)

Note: to understand the (shall we say) "final economic cost will be", that any aircraft engine is around 20K dollars "at least" usually (bare price).

The following article has quite some wisdom inside it

Link: Super cub comparison (STOL + bushplane)

To assist at where to look, and "what may ever be a good sensible idea" for use in the Australian environment and personal or business life here is link to a general kit listing site

Link: Aircraft kits list

There are many good kit aircraft all over the world that are generally never found on any web site except their own. so deciding price for usability to practicality could take a few months of research itself just to short list! (as a wise man in South Park once said ..."ooh...i'm staying out of this on"...)

But here is another in the genre of 4 seat STOL (the requirement for Australia - 4 seats is not merely use for family but extra unexpected cargo weight)

Link: (USA) Backcountry Boss 4 seat bush aircraft (STOL + bushplane)

..."One more feature to remember to ask the manufacturer, is whether both "anti-ice system" and "carburetor heat system" are supplied as standard systems, "they are actually quite required" in Australia!"...

Link: (Canada - Quebec) Dream Tundra kit STOL 4 seat (STOL + bushplane)

Link: (Canada - Quebec) "Levitation 4" Tapanee Aviation 4 seat (STOL)

Link: (USA FL) BD-4C 4 seat "Not a STOL – Not a bushplane" BD-4C is here only for the point of people whom require a high speed commute light aircraft and would use a light aircraft on "prepared runways grass or other of home field and minor airports and alike" such as business persons traveling between major cities.

Link: (Canada - British Columbia) Murphy Yukon 4 seat (STOL + bushplane)

Link: (Canada - British Columbia) Murphy Moose "M14P - 600ft ground roll" (other is 800 neither actually STOL but is a bushplane with good cargo and speed)

Link: Vedeneyev M14P (360 HP)

Link: about Vedeneyev M14P (360 HP) and PF

Amateur built and experimental aircraft

Amateur-Built (ABAA) Aircraft — Certification (PDF)

CASR Part 21 - Certification and airworthiness requirements for aircraft and parts

Warning, there are few sensible kits for the practical purpose in the following catalog unless single lone personal use...bu' s'look !

USA kit catalog (PDF document [!WARNING] SIZE: "58 Megabyte")

Link: (article) Bearhawk Bravo STOL

Example manual: Kit Building Avipro Bearhawk wings (PDF) Riveting (PDF) Oratex fuselage covering Kevlar fuselage covering

BearHawk internals require to do sound proofing (Example products findable):

Car Sound Proofing Deadening Van Closed Cell Insulation Foam Mat (1) SUV Chassis Sound Proofing Kit Car Noise Reduce Sheet Damping Insulation (2)

This (*[quote - blazing saddles]... "this bill gentlemen"...*) particular kit aircraft is where cheapskate meets actual possibility and converts it to potentially achieve the desired outcome and make an expending cheapskate !

There are no reliable landing strips in quantity in Australia, So first a STOL that takes off under 120 meters full loading, HOWEVER, "TYRES" , because of judging a sensible strip (simply unobstructed open space and 2 times the take-off / landing distance) there can be some leftover weather results on the ground such as "mud and slurry" , a large diameter wheel "almost" handles this, but it actually should be at least 26 inches (better 29 inch) Diameter and "minimum 12 inch WIDTH" to handle mud and prevent sudden sinkage that would cause nose planting(diameter only does that partially).

The diameter of the wheel prevents holes in the ground such as dugout nests and soft patches from causing a wheel to get caught.

One more feature to understand is that the large width and diameter tyres will lower "safe rated cruise speed" if fitted, so for speed around **26 inch diameter x 12 inch wide is the smallest squeeze size** against collapsed rabbit or wombat holes.

Bearhawk (4 place) article "model B" STOL (PDF)

("Safe" required size STOL bush wheel

(PDF) Tundra bushwheel fitting info

(PDF) Tundra bushwheel maintenance info)

Of tyres and of such a diameter size is having to shorten the struts to lower the drag but causes worry about propeller strike from a flat !

The following product is a special anti-flat sealant and will not require actual balancing although to distribute it properly after input to the tyres will require some strange appearance driving up and down your private paddock strip a few times of 100 meters each day for 3 days and first one instantly after insetting.

(YouTube video)Anti-puncture sealant

Crankshafts in engines and a replacement after "prop strike whereby a problem called dialing occurs" is often half what second hand private offered engines or partial engines are about ! The other is engine hours nearing overhaul TBO.

The small numbers (e.g. 0.010) mentioned with crankshafts are usually thousands of inch (SAE / Imperial measurement) for bearing clearance runner ware, or partial degrees of dialing (bent off centre / circumference) or "lumpiness" (non uniform) circular-ness of the crankshaft (and crankcase) bearing runner surface relating its axis (whether it is circle oval or lumpy), best ask what "measurement unit" and context it is.

So "dialing" is the action by a mechanic at taking measurements on the crankshaft using a "micrometer" and reading the "dial-gauge".

However, its' purpose is to find damage more often than ware, so "*dialing is also a single word cliché that exists*" referring to the measurements from sudden engine stoppage such as propeller strike or oil loss / oil pressure loss seizure (any crankshaft internal combustion piston engine car truck or aircraft) because the crankshaft can also be bent angular offline from a massive shock "along the line" from "circular motion" alike dialing a telephone and "sending a message" as a shock down the to other end of the line!

While some prop strike engines that have been checked get a yellow tag for the crankshaft you will find the check only had .001 (one thousandth of an inch) , .002 (two thousandths of an inch) at worst as eccentricity, anything more than a few thousandths of an inch is starting to be heavy damage !

It is generally a good idea to replace the slipper bearings on the crankshaft after such an event.

Another point to note about prop strike, is that one of the main features that is a difference to an aircraft to a road vehicle engine is that an aircraft engine has a propeller axle with a single bearing set to hold the weight of the aircraft !

A fully loaded 4 seat light aircraft above ultra-light can weigh around two tonnes, so the bearing set on that axle must take all the loadings, but, however, can be damaged during a prop strike incident.

Other differences of aircraft engines (piston) with a road vehicle engine apart from aircraft engines being half the weight,

Aircraft engines have an either impeller or a centrifugally engaged clutch whether geared between the crankshaft and propeller or direct driven.

Aircraft engines usually have a "dry sump" and more than one oil pump to scavenge oil from the sump.

Aircraft engines have an oil reservoir tank and an oil cooler in their lubrication and cooling mechanism of operation, this is why an "oil temperature" gauge can often be found in aircraft instrument consoles.

Aircraft engines sometimes have a "pre-ignition oil pump" (good point if it's an airworthy propeller strike engine).

[! Unless you are educated and aptly capable of repairing and overhauling an internal combustion engine of various types it is not a good idea to buy either a repairable propeller strike engine neither an engine either requiring or nearing mandatory overhaul]

Finally, a properly operating engine is generally 25k reconditioned to 35k depending age and model.

The following mentioned engines are quite large cylinder displacement when you think about Australian vehicles of the 1960's , so why !?

If you were to want a 200 HP engine today for a car or boat it would be around 2.5 litres displacement , HOWEVER, with a piston engine for aircraft it is a massive 500 cubic inch thereabout to produce 200 hp!

The reason is thing called torque by built up flywheel inertia from engine RPM (often measure ft-lb - "foot pound" or Nm "Newton meters" / "Kg/m"). Most piston engines in light aircraft are straight through or direct connected drive train to the propeller.

Because of that 1:1 drive ratio without gearing, the optimum maximum RPM the propeller harnesses air is 2500 RPM and the engine must be then spinning at that RPM (usually during take-off for that RPM). So the aircraft engine will probably never be used at much more than 3000 RPM.

A car or truck however using top gear (straight through drive) can use 4000 - 5000 RPM that stores the inertia in its flywheel more economically to produce Horse-Power.

To recap and make the point better about proper STOL aircraft design since 2013, [Here is a 4 seat aircraft \(Vans RV-10\)](#) with a 235 - 260 HP motor and its takeoff roll at just on 1 tonne compared with these, the "Bearhawk Model-B" or alike a "Murphy Yukon" or alike a "Dream Tundra (160 - 240hp)", all STOL.

The roll being around 109 meters for the RV-10 with 235 hp, but with the STOL aircraft at around 1 and a half tonne (1500Kg) fully loaded they remain under 100 meters takeoff roll with horse-powers between 160hp and 240hp !

The STOL also climb at a lower speed and are safer and more responsive during this critical phase, however, the standard aerodynamics of the Vans requires higher speeds for control and stability.

All in all the Vans RV-10 is alike the Bearhawk original design 240hp, it is near a short takeoff aircraft but not actually, and requires higher horse-power to achieve a "similar appearance to a STOL" characteristic, but unfortunately it is the aerodynamics that give it the feature, that and STOL are a little difficult to fly at speed because the actions must all occur more gentle because of the response !

[\(1\) IO-540 IO-360 engine information](#)

[\(2\) IO-540 IO-360 engine information](#)

[\(PDF\) Continental 470 series engines](#)

[\(PDF\) Continental 520 series engines](#)

[\(PDF\) Lycoming IO-540 engine information](#)

[A Crankshaft](#)

[Crankshaft bearings measurement](#)

[Crankshaft runout](#)

[Crankshaft dialing - runout and teardown](#)

[\(PDF download\) CASA Propeller Strike Guidelines - bulletin](#)

[\(PDF\) Crankshaft specialists \(foreign\) "workshop services example"](#)

[Aviation parts tagging](#)

[. Aircraft aeronautical abbreviations](#)

[. Obstacles and Flaps](#)

https://www.youtube.com/watch?v=gi_6SaqVQSw

[Construction materials, machines, tools and "plans building"](#)

[\(PDF\) AMATEUR-BUILT AIRCRAFT AND ULTRALIGHT FLIGHT TESTING HANDBOOK](#)

At the very heart of some of these aircraft is construction from AKA "raw resources" with materials and industrial tools called plans building.

CNC machining of aircraft aluminium to make some complex shapes such as airfoil wing riblets may well be an option for some people if they can spend 3k to 5k AUD on a CNC aluminium cutting machine system of "at least 1200mm x 1200mm", However, above this size they then start to become expensive (for lack of better way of saying it) !

If you can spend around 50K to build an aircraft, CNC machine would be an ideal negligible cost to account into it.

1200mm x 1200mm (1.2 meters) gets you the ability to turn long parts of (e.g. 2300mm (2.3 meters) length) around on the CNC bench and run a cut A to B with a "second software map"(for another cut run) of the other end of a part on the same sheet, BUT must be set up on the CNC bench carefully to retain the absolute accuracy of the shape and cutting run !

The dividend benefit is however, time (from lower preparation and refining requirements) and accuracy of curves !

CNC machines use a standard computer with CNC software and CNC control box to cut the material on a the machines' bench.

The software is given a special graph map with the cutting run coordinates to follow to cut in a line from A (start) to B (end) inside the machine reach boundary of the bench. X axis and Y axis are two dimensional and not all machine have Z axis ability, but with Z axis are often used for wood carving (and maybe Bearhawk Patrol (all wood aircraft) riblets).

WARNING ! If you intend to build from "blue-print plans" and or with materials requiring welding using an electric welding system, "you must disconnect and remove the battery alternator and disconnect all other electricals including earthing wire if these are present on the vehicle" when welding e.g. sensor probes and RDAC e.t.c.

(PDF) Aircraft welding *(article) Mapp gas welding (with Mapp torch equip. for 3000deg C)*

MAPP gas welding (hell this article slobbers, why an angle-grinder in the picture?!!)

[link: wire torch weld joint flux for Chrome moly steel]

warning ! Using "MAPP gas torch" is not suitable substitute for safe-welding "4130 (AKA moly-chrome mild steel)" because of the weld brittleness being chemical not heat stress temper induced !, HOWEVER, After welding properly with any suitable of proper **"flux shielding"** (inert gas / arc stick covered or Acetylene assistant powder) "MAPP gas torch" is suitable to commit "stress relieving of the weld (lowering brittleness of the weld)" called normalising outside of an oven.

This is a standard Oxy-Acetylene procedure often taught to non qualified Oxy welders, It is done by allowing the weld to cool back to room temperature in its' own time , then use the MAPP or Oxy-Acetylene torch to heat the weld and its edge surrounds up to a level that is not able to be seen red-hot by weaving side to side over the weld moving along before the area quite reaches red hot, then leaving to re-cool.

NOTE: DO NOT quench any steel weld or it will be extremely brittle ! TOO, when normalising a weld with torch it must be an oxygen bottle combined pair system not atmosphere supplied !

WARNING ! Oxy Acetylene is an **"extremely dangerous gas welding system"** requiring **"valid levels of operator knowledge"** and "SHOULD NOT be committed by an untrained person", if it is required **get training from TAFE institute first** !

Another warning about welding ! Raw materials such as steel or Aircraft Aluminium grade types sometimes have "cladding", an "unprepared resource PERMANENT bonded cover material(usually another cheap non reactive metal) over the sheet or pipe product" to protect the surface of the sheeting or other raw(unprepared) metal resource and must either be cleaned off by machining or it may not be able to be used in that circumstance because it would derogate the weld strength joint of two joined sections of material.

See your plans notes information for the exact requirements of grades and types of metal and its allowed "variants" for each part to form and construct !

Also ! USA and Australia as Europe and many countries , have different "lookup indexing number

references" for types and grades and variants of steel or Aircraft Aluminium.

E.G. Aircraft aluminium , "4041 T3" , "6061 T6" , "2024" series Alloys (note: Welding any of these requires the exact correct "flux" and "filler alloy" and use of the correct "shield gas")

Both "Acroduster Too SA750" (Aerobatic + Agricultural) and the "BearHawk 4 place" types (Cargo + Domestic) have wings that are for most percentage made from these grades of Aircraft Aluminium. (Note Bearhawk Patrol is all wood aircraft 2 place cargo)

The Jabiru J430 Australian built kit aircraft made in Bundaberg Queensland is "not quite a STOL" (as some spurious site touted it can have a take-off roll of 150m although i have never found this so short in any of Jabiru's documentation) because of its landing gear not being wide heavy terrain tyres that would cut back its cruising and maximum never-exceed-speed. It is unsuitable for runways that are rough or unprepared, however (according to some sites documents) it does sport a take-off of roll of 150 meters (that does not appear to be true). Apparently the J430 and J230-D have the same fuselage but it would be a sensible point to understand Australia and the lack of support at landing and using light aircraft needs to have 120 meters as maximum ground roll fully loaded in a four seater with heavy terrain undercarriage for take-off landing at that maximum distance along with the NVFR specifications and bad weather de-icing spec too.

Storching along from here....

The Canadian's have done it (a couple of home build kit versions), the Czechs have done it(one home build kit version), the yanks have done it (a couple of home build kit versions), However, what stinks is neither Australia nor Soth Efferika have done it (heavy terrain, high visibility NVFR bad weather STOL with under 120 meter rolls).

Of this previous point of "country of supplier" and "cockpit instruments", it is a good idea to know the full electrical requirements for the instruments AND the aircraft's "voltage regulator output specifications/parameters".

As you can imagine, an "option or package" of cockpit instrumentation may also need to be in the "correct language" e.g. English.

But there is a point to this mention here. Each instrument will have lighting and (maybe as with VHF two way radio or transponders) other potential components that require "a quantity of electric current" and "a specific operational voltage".

To put it succinctly, both the current (amperes) level and the voltage (V) require control to prevent damage or starvation (blackout or power fade) to the instruments and other electrical accessories.

In every type of vehicle (road air or water) electrical supply circuit between instruments, consoles, radios or lighting bulbs (powerful or tiny) is a device called a voltage regulator !

THE ONLY TWO CIRCUITS THAT DO NOT USE A VOLTAGE REGULATOR ARE ,

- (a) The spark plug with its electrical timing and transformer
- (b) The starter motor

Everything else must be supplied correct voltage and amperage from an off-shoot circuit from the "voltage regulator(s)" !

Too again, "instruments and consoles e.t.c. that could go into a range of electrical parameter situations of voltage and amperage" that operate from some "remote" (isolated enclosed) power source such as a battery and alternator in a vehicle sometimes have at the back either

different socket points for different voltages or a multi step setting switch with so marked voltages.

***** While an EFIS can be obtained at the cheaper end of a pricing system, The display size will be too small for many people to use for so much information , it does not mean it can be co-wired for zooming onto a larger LCD display stand alone or run from the machine by adapter.

"Consider using a larger expensive EFIS" or at least an EFIS with display output port and signal to larger (computer type LCD screen standalone) LCD screen output and wired in power supply (see voltage regulator section) that allows use with a computer LCD display that can be mounted in the instrument panel.

However, to use an ordinary computer LCD console will require probably 2Kg more of "12/24/48v (whichever the aircraft power system battery uses) to AC 240v inverter" and its "240v mains power source transformer" (usually supplied retail with the unit). If possible you should see about LCD consoles of similar shape that operate from such vehicle DC power supplies directly too.

The final difficulty ! , LCD displays often consume at least 100 watt of current which translates in amperage to "12v 8.3 amps" (100w 24 equals 4.15 amps) (12v 200w equals 16.6 amps, 24v 200w equals 8.3 amps), so again, the correct circuit and voltage regulator is important to map. That's the same as one or two landing lamps, so the/a voltage regulator will need to balance that for the alternator, but the alternator must be able to produce the maximum constant consumable wattage/current required.

[Link: \(A\) PITOT operated digital avionics instrument system](#)

[Link: \(B\) PITOT operated digital avionics instrument system \(PDF manual\)](#)

[Link: \(C\) GPS reciever to interface to PITOT EFIS](#)

[Link: RDAC engine sensors array manager for "compatible matching" iEFIS \(not EFIS\)](#)

[Link: RDAC unit installation \(DOC\)](#)

[Link: RDAC example installation manual \(PDF\)](#)

[Link: RDAC with dedicated screen for most sensors](#)

[Link: Article - Cylinder Temperature Indicators CTI - EGT](#)

[Link: Lycoming RDAC, and engine sensor fitting \(PDF\)](#)

[Link: Lycoming oil Temperature sender sensor installation locations](#)

[Link: \(PDF\) Lycoming operators Manual for you to muse](#)

[Link: Lycoming oil temperature and physical oil cooler system diagram / troubleshoot](#)

[Link: RDAC for fuel injected engines with MAP Manifold Absolute Pressure](#)

[Link: \(article\) PITOT static system](#)

[Link: \(article\) PITOT static system \(see image diagram of heated PITOT\)](#)

[Link: PITOT probe - heated](#)

[Link: PITOT probe mount and gaskets](#)

[Link: PITOT static tubes](#) [Link: PITOT static tubes "installing"](#)

[Link: \(PDF\) PITOT static tubes "installing and parts \(brand generic\)"](#)

And for setup of navigation equipment:

[Link: Australian Geomagnetic Reference Field Values calculator](#)

[Link: Types of "North" \(True, Magnetic, Grid\)](#)

[Link: Geocentric Datum of Australia manuls for the magnetic inclination if you'd ever nee it](#)

[Link: Mapping coordinate formats](#)

[Link: Online mapping example coordinates for Mercator "Hours Minutes Seconds", "Decimal Mercator", "Degrees and decimal minutes", and "Universal Trans Mercator](#)

(UTM) zones"

[Link: Convert between NATO UTM and "H M S" \(Degrees Minutes Seconds\)](#)

[Link: Types of Aviation Altitude](#)

[Link: Aviation altimeters and Altitude](#)

[Link: Aviation Meteorology tutorial](#)

[Link: Aviation aeronautical chart reading](#)

[Link: Weather map reading](#)

[Link: Weather map interpretation](#)

[Link: Airservices Australia and BOM - "Live" Aerodrome weather Cameras at bearing angles](#)

[Link: Aerodrome forecast map info BOM](#)

[Link: BOM.gov.au Aviation weather services](#)

If you add a component (e.g. lights or instrument or console known often electrically as a "load") to a circuit you must assess the total current draw of all added components and add "a suitable correct current and voltage voltage regulator unit" for the extra current(amperes) draw "loading".

Adding powerful landing lights are a huge clue, such added equipment are always installed in vehicles with their own separate voltage regulator in a completely isolated circuitry from the battery ! If you need the aircraft to be IFR compatible and add landing lights, you will need to consult an aviation electrician for light aircraft unless the required packages are accounted for to the aircraft kit supplier in total along with the kit (for you to order, use and "new pricing") !

Some components only print Voltage and "watts" consumed on the back of a load / component!

So if Voltage is a constant power rating of a circuit, and amperes is the actual electricity throughput drainage of the electrical source, WHAT is wattage !?

"wattage" is an expression of the quantity of energy used in that circuit or consumed by reaching the end of a complex component on its out end terminal (e.g. as to positive and negative terminal or power socket pins).

WATTAGE has one more important point !

Wattage is an expression of "the exact electrical consumption condition of ENERGY used"

To obtain "watts" is simple , circuit voltage multiplied by amps (volts x amps = watts).

Because some components only have volts and watts printed on them. "watts divided by volts" (watts/volts = amps (at that specific voltage)).

So if you have two different devices in your house operating from different electrical sources such as 240 volt and 12 volt battery and "their power consumption is the same usage in watts e.g. 100 watts you can "calculate the "amps" for either circuit".

$100/12 = 8.3$ amps (in a 12v circuit)

$100/240 = 0.24$ amps (in a 240v circuit) *****XXXXXXXXXXXXXXXXXXXXX

NO IT DOES NOT ! SO JUST FOR SAFETY ALWAYS USE A CALCULATOR

$100/240 = 0.416$ amps (in a 240v circuit)

So "to explain crudely in technicality" if you look at the fuse box in your car, each of those little 1A , 2A , 5A fuse ratings corresponds an output pin ("output pins imaginary point here" - to know actually how voltage regulators operate it is similar to an "inverter output" so understand these relating to "voltage drop in a circuit" OCV (open circuit voltage) and CCA (cold cranking amps)) on a voltage regulator specifically to deliver to one component over one

individual isolated circuit with the particular amperage current level at a rate a little less than that fuse rating (however, with large sudden current draw circuits such as flap motors and or headlights, usually a more suitable voltage regulator is placed in an individual circuit to prevent disturbance or damage to other electrical components) !

So back to the point that the "initial system voltage requirement of the aircraft's" alternator and battery circuit and charging balance voltage regulator requires to be understood first from the kit and supplier for the "instruments supplied into the console" and because of "correct operation levels of electrical supply", and the fact that "at some time landing lights and flap motor may be in use".

However, the battery itself is very important to understand!

Batteries have a finite quantity of energy stored!

So, what size in AH (Ampere Hours) of storage should be used?!

Here's a point to remember, if you use landing lights , flap motor, de-icing heater system and strobe lights, (probably landing at night)

The following 24 volt battery would potentially be dangerously low of electricity if you simply went into the hangar and switched off the aircraft!

Itself is not a good idea to leave or sit with the propeller being spun by the engine because family or other people could make contact with your propeller!

In fact, in 24v system with 2 x 500w electric motor for flaps (consumes at points for a moment 10 Kilowatts (surge and feed constant speed power) from their "motor controllers"), 2 x 100 watt landing lights, 1000 watts de-icing (lets say its a water version and a good cuppa), 800 watts of instruments-console, and 400 watt of strobe that equals (something like i could imagine) a 20 second drain on the battery of 12.4 kilowatts (in 24 volts) = approx. 508 (24v-AMPS) !!!!!

Then when no flaps, 2.4 kilowatts (in 24 volts) = approx. 98 (24v-AMPS) with landing lights and de-icing and strobes console-instruments.

1 kilowatt in 24 volts is 41 amps approximately | 1 kilowatt in 12 volts is 83 amps approximately

A 24 volt 13.6 AH aircraft battery such as found in a Cessna 150 is not actually safely sufficient, However, it is expected during this that the engine is operating so the "alternator is generating" extremely heavily!

Because the flaps are only used for seconds a 24v system to de-ice, strobe and operate the console and landing lights would need an alternator of 98 amps outputting at medium RPM of the engine.

However, usually / often only one landing light is fitted that an alternator and it appears this is no new problem but no real difference with only one landing light if the other systems are present.

Taking a look at an actual aircraft battery such as for the Cessna 150 at 24v in its "battery model data sheet" it can supply 600 AMPS fro 15 seconds "akin to 14 kilowatts" as calculated for the device , BUT it is only a 13.6 ah battery.

It means it can supply 13.6 amps for on hour "as a rating", HOWEVER, it can supply much more for a short period of time!

While this is not good for the battery, for most the "alternator ah rating size" is responsible for preventing such immense draw from the battery but it requires heavy duty "voltage regulators" too as much as a "larger alternator" OF "100amp @24v" !

Here is an online article about aircraft alternators

CONSIDERATIONS FOR ALTERNATOR UPGRADES: RUNNING ON PLANE-POWER

Here is a Battery Company data sheet for a 13.6 ah Cessna 150 24v battery

Concorder 13.6ah 24v Data Sheet (PDF)

If you want to understand batteries(the power source Voltage of the initial circuit) and current consumption by components(the amperage of the load(component operated on that specific voltage of the circuit)), read the "D.I.Y. Wind-Solar "Off Grid" ARTICLE" and also take a look at the "Battery Calculator page"(switch off the background image in the page menu).

here:

[Battery Calculator page](#)

Next is a little complex, while instruments are mounted on a panel in front of the pilot OFTEN they are connected to "data lines" connected to a sensor outside the vehicle(aircraft)! Never loom "electro-magnetically unshielded" data wires closer than 1 centimeter to any other electrical wire.

(another NOTE never place any physically stretch or taught/tight force temporary or permanent on electrical wires !!!)

e.g. air speed indicator sensors are often out on one of the wings.

Of instruments and mounting them into the instrument panel physically, there should be a rubber padding alike a gasket and if heavy and lengthy unit sitting in the panel should have support struts / cupping with rubber padding to prevent instrument vibration.

But must be secured / fastened into the panel board without ability to shake loose.

[Link: Wiring and control panels of Experimental light aircraft](#)

What should be on a control panel as basic / compulsory in any aircraft "in thereof NAVIGATION occurs to fly it":

[0. AN iEFIS "Electronic Flight Instrument System" (single unit often contains and replaces: Artificial Horizon, magnetic compass, GPS viewer, Barometric Altimeter, Vertical speed, ASI)]

1. "RDAC" engine monitoring system (Cylinder temperature, and Exhaust Temperature(lean and rich mixture sensing from exhaust)) iEFIS "compatible"

(note: the higher you climb in altitude, the richer the fuel mixture becomes, the lower you descend of altitude, the leaner("hotter burning" fuel to air ratio) your fuel mixture becomes in piston engines).

2. Oil temperature gauge

3. Oil pressure gauge

4. carburetor heat control knob

5. fuel enriching control knob

6. ignition on switch

7. starter button

8. ASI Aspeed indicator

9. Altimeter (barometric air pressure - from sea level)

10. vertical speed indicator

11. Artificial Horizon

12. magnetic compass (and heading indicator)

13. GPS system

14. turning meter

15. slip meter

16. Tachometer (with matching red-line to engine parameters)

17. fuel gauge

18. oil warning lamp

19. fuel flow warning lamp

20. Battery ampere / volt test meter

21. Alternator warning light

22. Flaps down warning light

23. - - (hybridised to control panel for non licensed uncontrolled air space user) "World radio receiver" with SW 1,2,3 (short wave) and cloak-wave operation containing Australian air band VHF frequencies receiver 118-137 MHz.

21. x - (not part of control panel either VH or Unlicensed (as suggestion)) UHF(476/477MHz) CB "80 channel" Duplex/simplex "5 watt" hand held.

* others by choice or "compulsory(VH) reason":

- Air band 118-137 MHz VHF(Very High Frequency) transceiver

- Engine cylinder(s) temperature monitor

- VH(VH refers to Australian national registration prefix) registration transponder (squawker)

- various "Air traffic anti collision assistance device" (database radioed) e.g. [ADS-B](#)

- FM/AM stereo radio CD deck

- Radar altimeter

*note: some of the above are able to be fulfilled as "EFIS combined"

Link: Radiotelephony communications and procedures in Class G airspace

Link: Airservices Australia frequency management

Link: Australian radiofrequency spectrum (PDF)

Avgas engine type and configuration is what to use to operate the engine of your aircraft. If you use a rare kit that has a diesel then you should only use "winter grade" diesel fuel because of ice or condensation danger. Avgas has some versions that help against ice or condensation! Another note, is "Australian regulation refueling" for both action (correct ground procedure), equipment (anti-static earth binding), and legislation!

(PDF document) https://www.casa.gov.au/file/146341/download?token=60_W8mwI

(PDF document) <https://www.casa.gov.au/file/78676/download?token=NpIFuSpo>

(link:) <https://www.legislation.gov.au/Details/F2011C00687>

(note: Float plane modification <http://www.zenairfloats.com/>)
other: <https://www.youtube.com/watch?v=9j6ZdxYWViM>

Other useful links:

[Link: VHF use in G class airspace \(PDF\)](#)
[Link: DAH \(Designated Airspace Handbook\) info example \(PDF\)](#)
[Link: Airspace risk management \(PDF\)](#)
[Link: Airspace Infringement \(AI\)](#)
[Link: Airservices documents and charts](#)
[Link: Maps and charts to be carried \(PDF\)](#)

“Uncontrolled air space unregistered (requires map and landmark reading skills)”)
Set online map to 0ft – 8000ft to clear out airspace shown above 8500ft
Uncontrolled airspace is class G and all below 8500ft
<http://xcaustralia.org/aircheck/aircheck.php>

...For many in Australia, bus train or airliner is considered more than probably safer for long distance travel than either light aircraft or personal road vehicle,...That's what you think! , By interstate train the injuries and fatalities are generally teeth and bones caused by one of 5 criteria of "blunt instrument", "shotgun", "pistol", "machete" or "hands fist feet", Again, Buses generally alike a car are road accident, and finally airliners are "safe" in Australia from fatality for most, However, everything else of airliners is amiss the goals and reasons of both personal and business travel with a high to extreme risk of serious or irreparable disruption to personal or business plans and or security(personal or business)....

The following "news article" has two of the most common reasons for Light aircraft crash in Australia (1) Flight planning management and two (2) fuel.

Home built (piston single) Light aircraft test flight crash, HOWEVER, bad Flight planning management most commonly causes "collision with terrain (in many ways as a broad term" through bad or insufficiently planned practices of flight path, of one of these being "overhead lines or wire-strike"!

These two ATSB reports typify the 3rd most common method of light plane crash (3) "loss of control" (stall - low air speed - low altitude)

- a. Loss of control
- b. Loss of control

ATSB 2016 Australian flight safety information media release

Most of the aircraft that crashed in 2017 (much media release coverage) were far over 20 years old!

In this document (following link) can be seen the "main" or common cause of fatal air crashes is "flight management planning" and second most common is "control handling operation", the last significant statistic in bulk killing is "bothering to or how to respond to emergency" ! Any questions why it is sensible to get training and VH use accreditation with PPL "not RPL or simple us of uncontrolled airspace" !

Statistical fatal air crash cause breakdown CASA-ATSB (PDF)
Human factors in Australian aircraft crashes - ATSB (PDF)
Low level flying - ATSB (PDF)

Collision with terrain anomalies - ATSB (PDF)

Ordinary Visual license pilots in wrong meteorological conditions - ATSB (PDF)

Government issued warning - starved and exhausted

... "Ground-based animal strikes were relatively rare. The most common ground animals struck by aircraft were hares and rabbits, kangaroos, wallabies, dogs and foxes. Damaging animal strikes mostly involved kangaroos, wallabies and livestock."...

Bird and ground level "wildlife and animal strikes" stats info (flightsafety - article abridged)

Bird and ground level "wildlife and animal strikes" stats info (PDF report ATSB)

... "but if i go to hell then i hope i burn well"... (Source: Australian Transport Safety Bureau)

Link (article below): Anti icing equipment and meteorology crash example information for Australia (You can learn an immense quantity about flying from "this articles' links to reports on the crash")

Note: "Nowhere suitable inside Barrington Tops forest NSW" is any space made in a few places for a light aircraft to land although it is a mildly deadly area because of its terrain and many high peaks coupled with partial alpine weather akin to the north above Australia tropical "Storm Factory" (re the storm factory: why you calculate the price of hangar construction or hire to buying a kit aircraft rather than covers and tie-down!), although it is one of the most rugged and difficult terrain in Australia for anyone to search if such an event occurs!

A quick note about hangars, always double wall them or put in advanced growth canopy spreading trees planted around the three enclosed walls, and, double layer the roof with an air gap between the sealed roof and the heat shading roof cover to prevent heat damage more of point of heat exposure over prolonged periods such as days to months!

The very problem shows why you should use "STOL with heavy terrain wheels and include anti-ice systems in any aircraft package" you buy whether Kit DIY or factory built!

Its not to look pretty, its to handle how much help the Australian government refuses to be to developing proper transit systems (that being light aircraft because of distance and environment) as standard for completely ordinary citizens, the government only chooses to be a parasite bloodsucker at any level and has known that road vehicles are monstrous problem to use over vast distance but only sees the regular "roll out of tax" in it ignoring the fact that with good roads it only swapped fatality for crippling injury, note too that Barrington tops National Park was a military training area during the Vietnam war and in principal is anything except a military area by proxy all the bases within a 100km any side of it! The accident investigation reports and supplement information will tell you a large quantity about IFR flight and fitness required by machinery for Australian environment conditions.

Q: Why read the above article PDF Article "Fatigue and distance travel in Australia" !?

A: Recognize that "time wasting of life" and "impossible achievement of a travel solution about fatigue and speed and time (particularly where it has to be flexible)" is all road vehicles bring! Until people get a (PPL) Private Pilot license and use VH registered light aircraft to remove long distance road travel, there will always be crashes of massive magnitude!

This head on crash beats getting "Falkholted" or "Pacific Highwayed" (Although this was "the Princes highway" it is the southern version of terrain and road to "the Pacific highway (Northern)") (called "Bussed" - re the massive bus/coach crashes in history on it)" Wed Jan 17, 2018 ("Although recent" it is "one of the worst multi vehicle head on car crashes in Australian history to date (at least since national highways were made multi-"ROAD" by 1995 - 2000 and particularly because they were only ordinary small road vehicles)" and as YouTube can show "means QUITE SOMETHING to achieve that level of destruction of life by cars only")!

Link: "Picture of Falkholt boxing day accident location scene" shows the debris field (and liquid spillage) only little more than 50 yards long and for most is only impact inertia scatter that like many road accidents" has following cars run over it. Too the head on impact stopped both vehicles "ALMOST INSTANTLY" (as severe as that ever is except for the fact the vehicles struck "offset to center" but head on, center is all it was not) as they remain only a yard or so from each other, they show they were "offset at impact"(not "absolute center") by their rest position and revolved each other "at point of impact" "possible half a rotation (180°) only to facing opposite direction or a full 360°" depending which vehicle is which in the picture). An immense impact !!! , they only left "the collision impact point" by three yards and five yards from full speed collision in both directions to instant halt as shown by the short sparse debris field in the picture !

No idea how "anything" could survive that impact in either vehicle for a tiny moment (and probably did not), although forensics on Lockerbie disaster found time of death for two passengers of the 747 may have been sufficient to save them if they had been found shortly after alighting, but "to that effect" in the boxing day crash (200kmh to 240kmh collective impact speed to instant halt within one to two yards or less) no such atmospheric assistance was a "chance" to cushion impact.

Anyhow, nothing unusual, just more common other ways in Australia (except between 1960 and 1995 on roads in Australia).

NOTE: Some of the problems of weather (e.g. Heat-wave ! there have been 10 heatwaves in Australian history killed more than 100 people!) and other problems found in the following disaster link is a reason to have a PPL and VH registered light aircraft!

What occurred upon the Falkholt family (massive fatality in moments) is what that is as risk to use a road vehicle in Australia for many many more reasons also than simply the bad driver that hit them!

RES IPSA DES, it is the A typical result of the long distance journey on Australian roads.

Link: (very uncomplete) List of disasters in Australia by death toll (re: road, rail, bushfire, Cyclone, flood - note: "Heat Wave" totals, pandemics, shipwreck, prison break, Sea battle, mutiny/massacre and air raids)

Link: ...And only for history sake, "the completely obscure" from the previous link !

Link: ...And only for history sake, "the 101 of completely obscure and unusual" from the previous link (for completeness) !

Link: ...And only for the fact that public transport has long been a disaster, "the 101 of public transport" !

e.g. *Australian head on crashes Youtube*

YouTube: head on crash Australia

YouTube: head on crash Australia

Other head on crashes (Australia) !

YouTube: Road vehicle crash Australia

However it occurs, it's like the old AC/DC song goes, ..." Hells Bells ! " (which sound more like crunch!)

• (speaking of "crunch" (or single dull "thud", "donk" or "whack") as a more realistic sound, don't listen to all of those Hollywood movies with air crashes if you are a bush-walker)

VH-MDX air crash 1981

The answer to this is if you buy a light aircraft, be sure its' kit has or the factory machine incorporates anti ice equipment fitted to your aircraft, (that also means changing to a larger battery and generator as to putting more lights on your aircraft means the same).

URL Picture of VH MDX

Picture of VH MDX (fair use de-enhanced colour)

It is actually a high powered six seat aircraft, and was being flown by IFR rules by that point it disappeared.

(PDF) What IFR roughly involves learning (US training list)

- For those that make a day out of IFR news and blog articles - - For the rest of us, what the hell does that mean?! (CASA) -

...If you can't go to hell for that, then what the hell do you go to hell for...

News Article on VH-MDX

Report on VH-MDX

Operation Wittenoom search (PDF)

VH-MDX Communications (PDF)

VH-MDX Initial-Overview V2 (PDF)

YouTube site video "recording of conversation with towers minutes before vanishing"

<https://www.youtube.com/watch?v=JD2j4-tlmVQ>

140 knots 72.02222222m/s 259.28 kmh

170 knots 87.45555556m/s 314.84 kmh

199 seconds from the last radar point measured to final communication transmission

Altitude decent around 60kmh - 1000ft/minute (mean)

(maximum traversing from final radar point @140 Knots): 14.328 km * given speed by official investigation *(note: possible 110 Knots "under 8500 feet")

(maximum traversion from final radar point @170 Knots): 17.4036555644 km

100 seconds down to 3000ft is more likely the best it ever managed (note: -not 120 seconds-, when things fall with gravity it is an acceleration):

@140 Knots: 7.2 km

@170 Knots: 8.7 km Meters - feet

1000 - 3280 * "becoming almost impossible" to miss terrain !

1100 - 3608

1200 - 3937

1300 - 4265

1400 - 4593*

1500 - 4921*

*1400 (Radar fade point: at 2 O'clock extent to 3O'clock at "1.5 - 2km" is a peak classifies as this and another 3km at 2 O'clock)

*1500 (Radar fade point: In a semi circle arc from 8 O'clock around to 2 O'clock classifies as 4824ft)

*1400 - 1500 (Radar fade point: Most of what is behind and to (port) left classifies as 4824ft also)

Topographic of Barrington Tops National park 5000ft radar fade point (320°M (330°T) point associated Williamstown Radar receiver - 45 Nm)

Wind was south-west to westerly and around 30 knots (30-50) more likely 30 at or below 5000ft, drift to easterly - north east is around 500m to 1Km a minute mean.

However, listening to the ATC recording the pilot appears to have taken alarm at the altitude, which leads me to believe he possibly had an "elevator" control failure at that time that he was completely unaware of (but maybe found that before the whole incident ceased and finalized) and that he "attempted the turn" after agreement with ATC at the moment thereabout when he said "6000" as his altitude.

When turning a conventional light aircraft, lowering to suitable wing loading speed first, then it requires increased engine power(or propeller pitch with constant speed gas turbine), but it is because of the requirement to maintain altitude in a normal turn with excessive drag for the aircraft angle during that aerodynamic problem of flight.

With ice forming, it can jam control surfaces and coupled with wing ice destroying the aerodynamic shape of the aircraft lift surfaces, it then has "almost no flight aerodynamic characteristics" and commits plummeting more than flight, trouble is however, "turn the aircraft" (called "banking") with all that together and there is "NO aerodynamic flight occurring" whatsoever, and "no elevator control" to vector the engine power against "turn slide altitude loss" a standard feature of aerodynamic operation during a turn (akin to a stall, or coffin corner) ! If anything, the wind speed and direction and its effect on the aircraft heading would then decide the final parameters of its resting pint.

One other point to note in the recording is quite subtle! Anyone whom has sat with a truck driver on long haul trips often will find that to "keep awake" (AKA keep "aware") is the "attitude" in the voice of the Truckee to attempt to hold conversation to stay awake and aware!

It is not dissimilar to the attitude of the pilot in the ATC recording although the journey is nowhere near as long (pardon the pun) as long haul truck driving. Moreover, there is some evidence of losing potentially "mild physical" (radio button) and "mild coherence" but is extremely blanketed over by the unfolding gravity with which it appears he may have no proper explanation for and could not give to the ATC.

Again too he did say that some of the actual "~~electric driven~~ equipment "engine driven" (vacuum) equipment was not operating *[valves and controllers use solenoids! see link].

(NOTE: Oddly electrical or engine driven).

If so then the (APU) air pressurization system may be on the same circuit and shutdown also!? , "hypoxemia" for various reasons may have been setting in, although the last of the recording sounds alike rushing air in the background such to having a door ajar mid flight. So to summarize, ...up and down like a yo yo.. OR (and quite subtly) ...compass swinging like blazes... could simply be the inability for the "rear elevator control surfaces" to be used to vector the aircraft causing rudder buffeting by the wind and direction (note: can "saw"(reverse) almost as violently and by speed opposing direction momentarily, and by speed in a storm at angles (wind shear)). He may not have known this with any surety until the last minutes or had any true idea it was "the problem" when he contacted the ATC. It may have been the "compass" was responding but the aircraft was not, but being blown around anywhere, he may have only had "odd" steering from rudder and ailerons not realising the elevators were not operating.

VH-MDX-Meteorological-Conditions-V2 (PDF)

Note: with the topographic map, to read the map you need to "zoom the browser window", after, setting the map to the piece wanted in the window!

Topographic of Barrington Tops National park 5000ft radar fade point (320°M (330°T) point associated Williamstown Radar receiver - 45 Nm)

Now for something useless, all a complete waste of time! (look at Figure 16-3)

So what of flying in the Burmuda triangles of forests ... "where to go" "anyone give a sh".... One thing not mentioned in this article is "emergency locator beacons". As that is the below video of Vietnam Hueys shows that Vietnam had little difference to Australia "until" reaching geographical areas of rice paddy, everything else including farmland prairie and forest is geographically Australia, including piles of rock dust and grass. Locating was done with satellite and UTM mapping no far different to GPS. Soviets had satellite GPS systems in the early 1970s also.

<https://youtu.be/IgL5jOypOQ8>

<https://youtu.be/QCsnuDBw27o>

Of helicopters, not mentioned much of kits here, i have always felt the UH-1 utility design and particularly its pendulous system for weight and angle was one of the best ever made (in the utility carrier context - excuse the megalomania), but it also has another feature that civilian helicopters don't along with it, that being Horsepower! It is just a sad fact that many helicopter accidents do not run along the lines of light aircraft but rather because of horsepower and maneuverability by larger stronger bat(blade) and pendulum system, and such design mechanisms in civilian helicopter terms are often kept less efficient, in so far as the problem with light aircraft before the modern 4 seat STOLs since 2013 comparitively, the civilian helicopters are less powerful (blade and pendulum strength too) and less maneuverable (weak), and often weather handling takes them !

Many of the links following in the red box require a PDF reader

What stops homebuilt light aircraft being built (aside cost) :

1. Nowhere sensible, safe (OHS) and secure with enough space (a couple of feet larger than the constructed aircraft size in any direction) to build it (particularly the immense toxicity of paint and glues)

2. Nowhere to take off and land and acceptable legal usage airspace to use it

3. Nowhere to store it while not in use

4. No tools (or not the correct tools) to build it with

(5) It can be said that most people do not commit being their own customs broker with importation to port for ACBPS for tariffs and GST

==== for example from the **"duty rates applied book Schedule 3"** in "rates of duty payable list" Dept. Home Affairs , these two numbers, the "reference number" with its statistical code must be filled in on the **N10 import form example (PDF document)**

Warning: This must all be done over **VPN closed business internet (ICS)** with **Personal digital certificate** and CCID requiring (EOI) check from Australia post for the online digital certificate authority issuer for you to obtain the **"Type-1 individual digital certificate" (not other authentication systems offered) (PDF document link)** to use in the ACBPS

ICS(Integrated Cargo System) within time frames specified by ACBPS and notified with the correct information **48 hours prior to vessel arrival before the goods reach Australia !**

Generally goods that do not fill a container are carried by cargo ships as Break Bulk (BK) to **a port** (You can learn all this in the DIY off grid article int his site - NOTE i am to re-update(repair) many links in the pages)

NOTE: "8802.20.00" is a complete aircraft fully constructed NOT parts (e.g. kits).

Tariff code "reference number" 8802.20.00 , "statistical code" 05 | - Aeroplanes and other aircraft, of an unladen weight not exceeding 2 000 kg

Tariff code "reference number" 8803.10.00 , "statistical code" 10 | - Propellers and rotors and parts thereof

Tariff code "reference number" 8803.20.00 , "statistical code" 11 | - Under-carriages and parts thereof

Tariff code "reference number" 8803.20.00 , "statistical code" 12 | - Other parts of aeroplanes or helicopters

Tariff code "reference number" 8803.90.00 , "statistical code" 13 | - Other

Helicopters "8802.11.00" and "8802.12.00" are complete helicopters! and "helicopter parts thereof" are with "aeroplane parts" in much the same layout in the schedule 3 table

NOTE: Duty payable may be free , HOWEVER, GST must be paid !

Yes! (*that solves that little question*) exchange rate is reasonably instant at the moment of transaction !

Also, international bank transfer by TT(Tele Transfer) , the "exchange rate" is usually 1 cent more(worse) than the standard published exchange rate against AUD as a normative, and your bank usually will require you to have a few thousand left over in the account at minimum for such larger transaction "as per banking company banking policy".

Unless the selling company offers "CIF (Cost Insurance Freight)" trade deal terms to an Australian port, you will need to find an Australian import sea freight forwarding company that also operates an office in the "product country of origin" to hire to obtain and load the product on behalf of you and probably manage the TT transaction in some form!

Link: Steps of importing heavy weight goods "sea cargo import"

NOTE: The following document has a minor error at mentioning "N30 release" that is only for extradited goods in "a warehouse or factory AS foreign zone on Australian secured zoning NOT standard or normal action of importation. e.g. comes into an N30 factory , is assembled and then placed on a ship and leaves to a foreign destination.

[Link: comprehensive step by step example of importation \(PDF\)](#)

[NOTE: Customs clearance pickup area requires knowing the areas and zones of the port: There is a truck marshaling area , but it is secure and only allowed at allocated time]
Normally a load of **batteries** at 2 tonne weight costs AUD 1500 - AUD 2500 to freight alone, but, If you have a normal class "C" drivers license you can hire/rent a 4.5Tonne GVM van with tail lift for something like AUD 1000 for three days or less for 24 hours ***ONTIME HIRE BOOKING IS A PROBLEM HERE - pickup must be done within an hour of being notified or customs warehouse and port penalty rates will apply ! (if **batteries** and kit arrive the same day or near to you can wait and pay p/day dock rent(arrange first) , as much if your kit totals less or probably near 3 tonne with **batteries** you can use a 3 tonne van or truck), allowing pick-up at the docks after all customs inspection and dock / handling fees GST and Tariff are paid online over the ACBPS secure VPN (ICS) Integrated Cargo System application.] * Other required equipment is a pallet-jack-trolley , heavy rope, padding carpet patches and three able bodied people.

Link: (PDF) If there is some form of different approach...

Solve these problems first in some safe efficient permanent way and then acquiring a kit home-building the aircraft can occur!