A cowboys guide to the Cessna 185

These notes or collection of trivia are just a collection of thoughts on 185 handling and other aspects of them. There is very little material for those newly rated or new owners to gain information from, so the following may be handy. It is intended to be a useful so contains advice on some operations that are ill advised and outside the normal flight envelope. Sometimes people end up there whether by intent or not. Much of this stuff is opinion only and can be taken as a guide, above all use common sense. The only way to learn to fly one is to go and do it, as with all motor skills, but it is better to start trying with a few ideas rather having to think them up at short notice. Most Aircraft and Company material is written with a view to avoid legal liability, in some cases by lawyers for lawyers. These notes are intended to inform which does not mean you need to try all this stuff at home. Since the 185 tends to be used for short field and mountain flying these notes are written with that in mind. That is where my experience was gained. Specifically in the Southern Alps of New Zealand and commercial ops in Papua New Guinea. My total time on the 185 is only about 1000 hours but covers 30 years since I went school in one as a kid. During that time most parts of the flight envelope have been given a look. Also the best way to gain experience is to use that of others, the PNG training system did just that thus turning the abnormal into daily operations for average Pilots. There will be no mention of Float and Ski operations or 180's specifically as I have no experience in these fields. Apart from some engine and weight details though a 180 can be considered the same Aircraft, because it is.

General

The 185 is a development of the 180 that is a development of the 170, a design which has its origins in the early 1940s and was inspired by pre war high wing Cessna's. It is not a state of the art design, but the laws of Aerodynamics and Aluminium construction have not changed in the last 50 years anyway. The fastback 172 and the old tailwheel 170 share many airframe components, much more so than the 206. The reason for its success then is a large engine in a small light airframe. It has proven to be strong enough for the task and is advertised as having a payload equal to the empty weight of the aircraft. This has handling implications that will be covered later. The 210 will go faster, 206 have more room, 182 be easier to handle and the 172 is cheaper to run but a 185 is a good balance of the lot.

Best of all they are great fun to fly and are an appreciating asset, which can have quite a low operating cost if flown properly. Unlike most of the Cessna model range the 185 never changed its shape size or speed. There are a few detail changes in construction over the years but from a Pilot point of view a 185 is a 185, though for some reason the later models seemed to get heavier on the controls and less docile.

They can be customised to some extent by the configuration for what they are doing by changing tyre sizes, adding a cargo pod, altering the rigging on the wings and adding leading edge kits. As a result the speed can vary by about 20 knots between machines depending on how they are set up. Mostly the engine is the trusty old Continental IO 520 but early models used the IO 470 and some have the IO 550 installed. Turbocharged Continental and Lycoming engines can be used but unless there is a specialist application on floats or at altitude there is not much point as it is already a well-powered airframe. There is added complication with a turbo as well, which explains why most aircraft with these engines tend to have two of them.

Picketing

A surprising number of rebuilds are the result of Aircraft being blown off the pickets. Much more so than a nosewheel as a 185 sits in a flying attitude so any decent gale will cause problems. Mostly decent pickets will do the trick but cases have been known of the tie down attachment on the wing pulling out since once wind speed gets to around 40 knots substantial lift is generated. One way to solve this is to raise the tail to achieve a negative angle of attack. Digging the mains in a few inches by whipping out a couple of sods with a spade and putting the tailwheel on top of a 12-gallon drum or Ute deck should do the trick. The other way is to put a couple of mattresses on top of the wing, put some bits of wood on top and tie it all down securely. This will destroy the lift on the airfoil. Never tried either myself but occasionally a very strong gale is forecast is not practical to move the aircraft. Certainly the mattress idea in a 40-knot gale is a bit theoretical! A further problem is damage from windblown material; I have had a cowling dented quite badly in this way. Parking a vehicle in front may help and make sure there is nothing obvious upwind like an unpicketed Piper Cub, tent city of asylum seekers or Microlight convention to head your way.

A further option is to park downwind so the Gale approaches from behind. This may bend a few control rods and hinges but the thing will most likely still be there in the morning.

The parking brake is unreliable and wheel chocks are better put in before you leave one unattended. Take them with you, Aircraft have been lost by running down banks unattended. Leaving the engine running and getting out is not good. Leaving aside the handbrake and propeller danger the Throttle is capable of creeping forward increasing power.

One other hazard is stock, mainly cattle. These beasts are very inquisitive and like rubbing on things. This means if you go away for a short period thinking it will not be a problem as they are some distance away most likely on return the aircraft will be surrounded and possibly damaged. Know of at least one tailplane rebuild due to this. Best solution is a small electric fence and energiser around the aircraft or to move the cattle.

Loading

This is important since many problems in the air start on the ground with improper loading. There is also quite a skill to it since there is not much room available for the payload and doors can be a restriction. Regarding the door they come off easy enough for cargo and this stops damage from being twisted around the strut, which wears the strut as well. Stretchers and Coffins can just fit between the strut and doorpost, hopefully without having to tip them sideways, as this can get real untidy. Some models have a further door behind the baggage door to assist the entry of such things. Do not leave the doors open as they are light and a slight breeze from behind will catch them and twist them around the strut. After which there will be considerable wind noise and it will be difficult to close the door since it will no longer fit. Best way to shut them is to open the window, stick a hand out and apply pressure from the outside. Passengers will slam the doors and this can deform them around the latch area. Beware of long sharp objects, morons will poke these through the windows quite easily and tradesmen are the worst. If there are five passengers and no Cargo Pod put the people in first and fling the bags on top, smallest in the back. If you can get a belt round them and within the weight limit it is possible to get several people in if they are small enough and do not whinge. Small pyramids of people work well and my personal record is 13. Do not put people in the Pod, this is reputed to be most unpleasant and may put the victim off flying altogether.

Handle everything yourself or one day some remarkably heavy object like a Caterpillar starter motor or backpack of uranium ore will end up in the Aft end without your knowledge. With a Pod all the small heavy stuff can go right at the front which helps balance

things. Try and keep small crowds away while filling it, they only get in the way and annoy you. It may take a couple of tries to work out how to fit all the stuff in.

The big trap is the area aft of the back seat, which can have a large space available in some machines. Use this for light gear like foam mattresses, sleeping bags, Polystyrene and Ops managers brains. Have a good think before putting more than a few kilos in and it is not there as overflow space when the Pod and Cabin are full. The effect of Centre of Gravity problems with a probable overload can be unmanageable once airborne. A colleague of mine met his end not so much due to a substantial overload but the fact that the aft compartment was used to achieve it. Several people shared his fate after control was lost during a turn on route to the Airfield, it either stalled in the turn or entered a spiral dive due to lack of pitch authority. An extreme example but bear in mind that on a long flight centre of gravity will move Aft so what may have been manageable on takeoff may not be a few hours later on landing. A good check on departure with a full load is to check the position of the trim indicator. If it is full forward or close and you are using forward stick consider returning. The Aircraft will not fly tail low but will become very sensitive in pitch as the tailplane becomes more ineffective. It is the same size as a Cessna 172 one, compared to the larger 206 one which has the same payload.

Once flew vegetables out of mountain airstrips to a large international airport. It turned out that I was underestimating weights and with little fuel and a Cabin and Pod full to capacity with around 650 Kilos of Freight there would be an Aft C of G problem on landing. What happens is as speed decreases control surfaces become less effective so trim goes forward until it runs out. Next Flaps come out and further Poling forward happens. Finally at around 300 ft full flap is selected and the control yolk meets the instrument panel with a rather distressing thud. Left unattended you will pitch up, stall, plummet to the ground and die. To avoid this messy scene simply get rid of some Flap and control will be restored, carry on with the landing. Have never explored the option of applying full power to retrieve the situation in a 185 as power provides a further pitch up moment. Some brave person can feel welcome to try this and it is a sound idea in an Islander with engines mounted high, but a partial flap landing seems to be the best bet in a 185. In the situation outlined coming in fast with little flap was not a problem as the runway was about 3 km long, but shorter places may not be so easy. So if landing in tricky places with a load a good idea is to select required Flap and reduce to landing speed early. Incidentally the same principle with use of Flap applies to any aircraft. The 185 will not show any sign of Aft loading on the Apron, so lends itself to the odd drama in this area. Most other machines have a nosewheel so will fall or lean back if not properly balanced and get spotted.

One type of load that can surprise is steel pipes or any other heavy stuff sitting low in the cabin largely out of sight. As the saying goes out of sight out of mind and twice I have carried pipes and nearly failed to complete a low level turn clearing stock. I had expected the Aircraft to be light having neglected to take the load into account since it did not catch the eye. As an aside it is easy to get carried away with low level manoeuvring in remote areas, be careful out there as it is a major source of Fatal accidents.

Regarding amount carried the payload with full fuel varies with each aircraft, but most empty weights are around 800 KG. So around 750 KG of fuel and other stuff can be carried. Most jobs need 2 hours fuel plus reserves say 120 KG plus a Pilot at 80KG so a ballpark payload figure is 500KG plus or minus 50. For a long trip reduce by 40 KG per 100 NM longer than 250 NM. With a Cargo Pod and some hefty passengers Max weight will be reached easy enough, especially with full tanks. For a long flight there is a good case for stopping half way for comfort and refuelling as well.

Overloading in an Aircraft with no cargo pod or Aft compartment is difficult but with a Pod and long-range tanks easy enough. As explained above the main problem is it usually

goes hand in hand with an Aft G of G, but there are other issues. Structural ones are load on such things as landing gear, floor, brakes, wings and so on. On the landing gear the mains are strong enough but the tailspike will break and so will the tailwheel hub and tyre under heavy load. The cabin floor is actually quite weak unless it has plywood over the top. Early 185s were used for topdressing in New Zealand and operated in the Agricultural category with increased Max weight. They all have patches on the wings due to cracks in the skin along the main spar, and usually a few ripples and twists as well. So the extra load must have taken a toll on the structure. The brakes can overheat and the disk itself is capable of shearing off and pulling off the attachment bolts, common on the C207 due to the increased mass.

The main problem though is no surprise, if you put too much in the thing it just will not fly very well. It does not take much extra to make a difference either, that is a 5% overload will make a 15% difference to take off distance etc. Once flew a load of parachutists, two of whom were called Peter and both climbed in when the name was called. The extra 80KG on top of a full load led to a substantial takeoff roll, the Aircraft just got light on the wheels and stayed on the ground until speed built up enough to fly at that weight. Once in the air it is very slow to reach climb speed but once done the rate of climb is quite acceptable at low altitudes and cruise speed will be little affected. Really though the cheapest way to carry a heavy load is by the means of two light ones, this is especially true for short trips in a 185 where the loading can take longer than the flight.

Remember that once loaded outside the weight and C of G limits you are in Test Pilot territory and normal assumptions on performance, handling, stall speeds etc go out the window. One thing not to leave behind though is fuel, especially on a long flight in ordinary weather. An hour's fuel only weighs around 40 KG and does not cause a C of G problem. When push comes to shove they will fly if a bit over, but will not run on air. Also on landing from such a flight you will be 200KG or so lighter so weight is not an issue on arrival.

Ground Handling

For generic tailwheel handling there are articles around covering the physics of it in detail, complete with diagrams. Read one. Before start manhandling can cause damage, the Tailsection skins will not always put up with people pushing to get the tail round. Also the forward tailplane hangs off the trimjacks so is not as robust as it appears. The forward Fin skins are very thin and will dent easy. On your own a rope attached to the tailspike allows you to steer and pull at the same time, or push on the top of the tailwheel if going forward for the same effect. This method allows you to see both wing tips as well. Some later models have grab handles just forward of the tailplane, these are quite worthwhile and can be put in as a Mod.

Starting itself can be an art. Details are in the book so read it. Hot starts can be difficult due to fuel vaporisation in the lines above the cylinders. Purge the lines with full throttle, Mixture to idle cut off and full electric fuel pump for about ten seconds. This will cycle the heated fuel back through the return pipe and replace with cool stuff from the tanks. Once started it will most likely die after a few seconds so catch with the electric pump briefly and it should run smooth from there. Throttle and mixture settings as per the book or anything that works. Do not over prime as the excess fuel can gather in the bottom of the cowling and catch fire, if there are leaks in the system it may happen anyway. These fuel fires can be hard to spot as there is not much smoke so look out for bystanders getting all agitated or check a shadow of the cowling for distortion. Just keep cranking the engine to suck the flames back inside the induction system. A start is best, it will either suck the flames in or blow them out. On one aircraft this was so common I would post a sentry with a fire

extinguisher for hot starts, it is possible to lose the entire aircraft this way but mine never suffered any damage from them.

Jump-starts from a car are possible and quite easy with a 12-volt system. On a 24 volt just a 12-volt battery may do the trick or you may need two 12 volts and three jumper leads, work it out. Do not crank the starter too much, it will overheat and burn up. Details are in the book. Manual Prop starts are possible but the big snag is priming the engine if there is not enough power to run the electric pump. Unless two Pilots are present, one to swing and one inside, there is much to go wrong so better left as a last resort in remote areas. If the master switch was left on but there is enough power to get a prime on a cold engine it will most likely start. One trick is to put fuel in the air cleaner for a prime. If the battery is flat because the engine will not go then a hand swing will be unlikely to work either. If no key is available it is possible to remove the earth wires from the magnetos and hand swing for a start, in this case engine prime will still be available.

Once inside and started up forward visibility is limited, to the right in particular. Nearly drove into a Cardinal once that was in the blind spot, so have a good look around before getting in. Aircraft fitted with the big tyres are worst, especially if they have the original small tailwheel as well.

Steering on a light twin is by nosewheel, differential power, and the brakes. In a 185 there are the brakes only and they are very important, lose them and chances are you will be talking to the Insurance bloke soon. Plus apply power it will wish to turn left, lift the tail it will turn left. Also the crosswind component for Taxy is around 25 Knots so at a large Airport just getting to the Threshold can be a saga. Biggest cause of brake problems is corrosion pitting the Calliper barrel, this tears the O-Ring and within 50 Hours flying the fluid will run out and the Pedal go soft. The Brake lines themselves can crack or suffer foreign object damage and be broken. As mentioned earlier the Disk itself can fall apart as well so give all these areas a good inspection before each Flight and do not be scared of spending money on putting things right. Some models have stowable pedals. Looking at the crash comic it seems these may not be as wonderful as advertised and need treated with caution. Remove except for putting fixed ones in for endorsements may be the answer. The RH side pedals can be jammed by cargo in turbulence, this is difficult to remove in flight before landing.

On a rough field Flaps are better kept up until line up. With Flaps down an angle is formed between flap and wing so flexing of the wings is difficult, the result is stress at the tailing edge of the flap, which will cause cracks half way along.

One of the abilities the Tailwheel allows is to pivot around the mains, almost turning in the width of the Aircraft, which is real handy in Airstrip operations. On concrete or Tarmac be kind to the undercarriage by letting the inside wheel inch forward slightly and allow the tyre to line up with the rest of the Aircraft. This will release the stress on the Tyre, Axle and gear leg and that occurs otherwise, especially if using big low-pressure tyres. Next issue relates to the speed of these turns. It is easy and fast to just jump on one brake and they will do a 180 degree turn in a couple of seconds, sitting on the pivot point this seems OK. Bear in mind that the extremities of the Aircraft are 15 to 20 feet away so for those bits substantial acceleration and deceleration is felt with a twisting moment as well. All coming from directions it is not really stressed for, especially the tailspike which will chose this moment to break. It is twisted by the sideways movement and it was during such a move that mine fell off. Have been told these ground loop type turns cause as much wear on the Airframe as just about anything. A mathematician could work it out but to spend an extra few seconds to turn round is easy enough.

Some Physics on Taxi with a crosswind. A wind from the right hand side is not so bad as Brake will hold the tail round while the Power used against Brake will also turn the tail into wind. When the wind is from the left hand side things get hard. At around 15 to 25 knots

crosswind depending on load, slope and surface it will not hold straight on Brake so weathercocks into wind. Right hand brake and heaps of power will not bring it round but due to gyroscopic effects (ask someone else!) a tail lifting force is produced. Next thing an empty 185 can nose over, hit the prop and damage the tail on the way back down. Two people I know have had this happen to them, so it is not just a theoretical possibility. One option if attempting a 90 degree right hand turn is a 270 degree left hand turn. Had an Airport with a sloping taxiway and the Trade winds in the afternoon made the turn left to go right the only way. Air Traffic will wonder where you are going at first but it works and is much less conspicuous than tipping up or going nowhere. Full Flap can help ground handling sometimes, depends on the wind. The brakes will heat up on a long Taxi and lose effectiveness; sometimes a pause is needed for them to cool. Good news is not much runway will be needed once you get to it so head upwind to an intersection if possible and once on the active just head into wind and go rather than lining up on the centreline, too hard on real windy days. One thing, due to the fact that they weathercock during a strong gust have never heard of one blowing over in the Taxi phase.

Take-off

Prior to line up check the magnetos, cycle the prop, set the trim, select two notches of flap, push the mixture and prop controls in, check fuel selectors and contents. Really that's it, every thing else is secondary.

Two problems can occur here, leaving the side of the runway still on the ground and reaching the end on the ground. As a rule the take off phase of flight is a reasonably simple affair unless the engine stops. In a 185 however it is complicated by the ground handling properties and made worse by the use of full power. On an airstrip with poor braking and a tailwind it may not be possible to control the aircraft in the early stage of the attempted Take off, there will be no means of doing so. This is an extreme case and two solutions are to point about 15 degrees to the right of the centre line, advance power over a few seconds and hopefully it will line up and then have enough speed and Prop wash over the Fin to hold course. Lightly loaded there can be case for a reduced power Take off. After the first few metres brakes will not be needed so heels on the floor.

On a sloping strip ensure you know where the centre line is, often it cannot be seen from the parking area so from time to time people spear off over a bank by mistake. A rough field calls for full forward elevator initially to keep weight off the tail wheel. When the tail is lifted there will be a further left turning moment so do so slowly, there is not much need to raise the tailwheel more than a foot or so off the ground. Once above 20 KTs or so the Fin will be quite effective but may not come into play until the Tail has swung 15 degrees or so from the line of travel. This can be quite disconcerting until you get used to it. Further control can be had by briefly reducing power, causing a right turn to regain track and then smoothly power up again. With the correct attitude the Aircraft will fly when ready, speed will depend on loading and type of leading edge.

Airspeed and control are more important than early lift off, even on a short strip better to use all of it and leave the end at a good flying speed than take off early and flounder along at too low an airspeed to accelerate. Likewise speed and control are preferable to vertical clearance over an early obstacle, within reason. The exception is a soft runway or long grass where it is better to get airborne and accelerate a few feet above the ground in ground effect.

One case where it is possible to use the entire Field length and depart at minimum flying speed is an elevated field with a drop at the end. This is most useful in hot and high conditions where power is lacking. The entire length can be used for the take off roll and around 50 KTs indicated will be enough to become airborne (just) and clear the end. Pole forward to avoid tail strike and gain airspeed, away from ground effect level flight will not be

possible so between 100 and 400 ft may be lost until climb speed is gained and the rate of descent arrested. This can be dodgy with an Aft C of G if unable to become airborne by the end of the strip as the thing is lobbed off into space without actually flying at all and may pitch up and stall. In any event the whole concept is better left to the very brave or stupid.

Length of runway can vary considerably from a usable minimum of 250 metres light at sea level up to around 1000 metres if loaded at altitude. Rough safe distances at maximum weight of 600 metres at sea level increased by 50 metres per 1000 ft gain in density altitude and halved for Pilot only would be good ballpark figures. Much less get the performance charts out and have a look at the wind, surface and obstacles.

One of the traps is to fly one around light and forget how much runway is needed when loaded. This happens mainly to private owners who may only have a few flights a year fully loaded and just themselves much of the time. On each take off it is a good idea to select a point where it is safe to abort and stop by the end. This point can only be guessed at by experience but around 40 KTs on the clock by half way down the field is a good start. On a sloping one way field it is common to be committed to continue on leaving the parking bay, so it varies from place to place. One mistake in undeveloped countries is to find indigenous people or pigs on the take off path and abort the takeoff too late. Chances are they will move quickly or cause minimal damage. Same applies when landing but be prepared to leave quickly if you hit one on arrival. Sometimes performance will be less than expected due to surface state, a wind change, engine snags or just overloading for the conditions. If not happy with it abandon early and remember that the end of the field is not the place to realise it may not fly. It is far too late by then and the only chance is to keep going and hope, otherwise an attempted abort will only result in a crash anyway. So may as well go in at full power make a proper job of it. On Flap settings it is normal to use two notches for takeoff. If still on the ground at the end of the field a further notch of flap will most likely help and there is data to suggest that the wing favours use of three. It would be interesting to do a trial on this. With a large sealed runway it is likely that zero Flap would reduce time to 500 ft at climb speed while reducing workload.

Climb

Once airborne a 185 is very similar to the other high performance Cessna piston singles only nicer to fly. Most of the comments could be applied just as well to any other Cessna with the naturally aspirated Continental 470-550 series installed. As stated in the book there is strictly no need to reduce power after takeoff, full power climbs are permitted and the 5 minute full power limitation on the IO 520 is only a noise consideration. Common sense suggests that to keep noise, engine wear and fuel consumption down power is in fact reduced, usually between 100 and 600 ft or clear of all obstacles.

A good climb speed is around 80 KTs, or the top of the full flap limit white arc is good because it is easy to spot at a glance. However 100 KTs can be a good cruise climb speed if light and down to 70 if trying to clear a ridge without turning. Normal power settings are 24 manifold and 2450 RPM. Keep fuel flow generous in the climb, the fuel cools the engine and largely prevents cylinder cracking from overheating and lean running. Climb only lasts 10 to 15 minutes in most cases so the extra fuel cost is minimal. One operator I knew leaned back to just rich of peak EGT in the climb and ordered new cylinders along with the milk and bread. Another does not touch mixture in the climb at all, had no trouble with cylinders and reasoned fuel is cheap. Personally I lean back to top of the green in line with the green is good theory, have had no problems with cylinders either apart from those cracked due to age.

Throttle settings have to be opened during climb until at around 6000 ft density altitude full throttle will be reached. Cowl flaps should be open though at higher altitudes they can be partly closed since the engine will be producing less power and the air is much cooler.

Cruise

Cruise altitude will depend on ATC requirements, wind, and any high ground. In theory full throttle height is most efficient but in practice there is not much in it between sea level and about 10000 ft density altitude. Less fuel is used the higher you go so with tailwinds up high good groundspeeds and low fuel consumption can be had. Apart from the savings this gives very good range as well, only snag is without oxygen it is very tiring. A good idea when levelling out is to go a couple of hundred feet above the desired level and slowly descend back to it, this will help acceleration to cruise speed and sometimes allows a few extra knots.

Cowl flaps can be closed at top of climb and remain there until landing, though some open them a little just prior to descent to cool the engine and then close again at top of descent.

Which brings us to engine handling. One aspect of running these engines is that the Manifold pressure measured in inches must always be less than the RPM in hundreds or the power plant will immediately blow to pieces under the strain. This is utter garbage, appears in no Engine or Aircraft handbook and yet is still taught by most instructors for non-boosted constant speed engines. Bear in mind that the Turbocharged IO 520 uses the same cylinders and the same compression ratio of 8:1, full power is 34-inch boost and cruise is 28. Fixed pitch propeller aircraft usually climb at full throttle with no ill effect. There is some unmanned drone thing that has a turbocharged Lycoming, it runs 28 inch boost and 800 RPM!

So it would seem over boosting a 185 engine is not an issue. Indeed having once run them at quite low power settings all that achieved was to fill the valve seats and cylinders up with carbon; they lost compression, as the operating temperatures were too low and combustion incomplete. Also engine wear varies with the square of the RPM. This means a 2000-RPM will have less than half the wear of a 3000 RPM engine, which seems to suggest that a high RPM will only wear the engine unless some boost is available. In a 185 high RPM also decreases propeller efficiency, indeed much of the noise at take off is the propeller tip going supersonic. My point is the question the practice of a cruise power setting of 24/2450; I would now look at using 24/2200 or 25/2300. More important than Boost is Mixture setting as unless correct engine damage will occur in a few flights. Too lean will burn valves and crack cylinders while too rich can reduce range and leave you short at the end of the flight, plus the cost of it. Ensure that there is a functioning exhaust gas temperature gauge to set the mixture with. Guessing from Manifold pressure, RPM and fuel flow may not work as one or more of them may give false readings. On climb keep fuel flow up and EGT down as discussed earlier, but in the cruise just rich of peak seems to be best. At lower power settings like a steep descent or holding peak EGT can be used as the engine can then handle it.

Turbulence can be a worry during cruise and descent, fortunately in a 185 it is more a matter of discomfort than danger. Most likely due to the use of struts, and in common with all the other Cessna singles with struts, these aircraft are extremely robust. The occupants will give up before the aircraft as proven by some clown in a 172 who equipped with crash helmet, full harness and parachute flew through the wake of a Boeing 727. He came out with bruises and some moderate injuries but the 172 was undamaged. One job I flew involved flying in the mountains in gale force winds, the result was constant moderate to severe chop. It was uncomfortable but did not appear to loosen any rivets. Neither did the dive through a hole in cloud, which ended up at the red line in the same conditions. Am not suggesting anybody try these things, just that the 185 will stay together when many other similar aircraft with no struts may not. In fact I doubt a 185 has ever broken up in the air. Within reason then

it is a problem a 185 Pilot need not worry about too much, but common sense dictates that when it gets rough take it easy and slow down. Do not use rapid control inputs except on the rudder when landing or taking off. Especially in the ailerons at high speed, this can twist the wing and then it will not fly straight. One of the greatest dangers can be from loose objects thrown around the cabin, so ensure all is tied down securely.

Some points on mountain flying, though it is really a separate topic covered by other material. Be very careful when flying downwind towards high ground, it is very easy to run out of room and hit it. Always leave room to turn away from any high ground ahead. Against all logic it is possible to lose a great deal of height very quickly, this does not need high winds either and can be quite unsettling. It will occur seldom enough for complacency to set in, for me only once every few hundred hours. Remember that at altitude little power is available and the aircraft will have a TAS higher than indicated, so once again leave room and remember it may not be possible to carry out a brisk level turn. If caught in a mountain wave it is possible to be forced up or down at 1000 fpm and feel control of the aircraft is lost, this is disconcerting. If possible the best bet is to turn and head with the wind, that way a high groundspeed will be gained directly away from the undesirable part of the wave. Even in an empty aircraft at low level it is possible to be forced into the ground unless some action is taken, in a strong wind heading into it at best climb speed will literally get you nowhere.

Descent

For a normal descent take the Height above the field in thousands of feet and times by three to get top of descent distance to destination in nautical miles. So at 6000 ft start at 18 mile and an 800 ft per minute rate of descent will bring you in nicely. Just bring the power back a bit and speed will come up to 140 to 170 KTs depending on how it is set up. In normal use reserve flying in the yellow arc of the airspeed indicator to near calm days, the above comments on turbulence are only included because this is not always possible. Remember to bring the throttle back on descent. This is very important otherwise the engine will end up not only over boosted but over leaned as well since the mixture must be enriched on the way down also. Probably the main cause of engine damage by the inexperienced.

If there are no terrain or ATC restrictions consider a 5:1 descent instead of a 3:1, it is easier on the ears and gives a speed increase over a longer time. Parachute dropping has a need to get down faster, as can mountain flying or dropping through a break in cloud. There are two main ways of doing this. Easiest is a straight line descent, just reduce power to around 18 inches boost and get airspeed up to around 160 KTs. As long as the cowl flaps are closed this has been shown not to shock cool the engine and it will come down real quick. Second way is a spiral descent with full or 3 notches of flap. This is handy in an aircraft without a parachute door or of coming down through a hole in cloud into a valley. Get the power back to 16/2000, bring the speed back to 55 to 65 KTs, put the flap out and roll in about 60 degrees angle of bank. Ideally it will require full aft elevator and you then control angle of bank and airspeed with aileron, a low speed spiral dive in other words. It will give a rate of descent of around 2000 FPM and require a very small radius. Snag is quite high G forces are involved so it is hard on the body, needs a high degree of concentration and does impose some stress in the Aft end. In near instrument conditions, when all you can see is the airfield below in heavy rain or thick smoke, there is danger of becoming disorientated and ending up inverted so keep a good eye on the artificial horizon or the ground. If cargo is on board consider the deck angle or else it may all come forward to meet you, try not to do this with passengers on board either as they may find it disconcerting. The same method works in larger general aviation aircraft such as the Islander, Cessna 402 and Bandierante. For the last two use 80 to 90 KTs, they will not stall because the vertical speed is such not much lift

is required. Also handy if caught in an up draught from a thunderstorm or wave conditions downwind of a mountain range in a gale and in danger of being sucked up into the cloud.

On reaching bottom of descent and joining the circuit it can be difficult to get speed back to the flap range in the early models. One solution is to fly downwind at 500 instead of 1000 and pull up on turn to base leg to lose speed. Occasionally someone on the field may complain, but I find telling them to piss off and mind their own business works well. There is no regulation against it. If a cargo pod are large tyres are fitted slowing down will not be a problem as the drag cuts into the top speed on descent considerably. In a later model with the 120 KT initial flap speed think about giving it a 10 KT margin, otherwise you risk twisting the rear spar. Downwind just check the mixture is in for a possible go around and on finals push the prop control in. Some open the cowl flaps on final in preparation for go around as well. I figure it is a distraction and an aborted landing is rare enough not to require it, so open them on landing. Like many of these things it is a matter of personal preference.

Landing

This is the interesting and lively part of 185 flying where from time to time it all goes wrong. For the most part it is simply a skill that requires practice, but the following ideas may help. Three main areas here, the touchdown, the slowdown, and ensuring the whole thing stops before the end.

The approach comes first and a normal 3-degree approach applies, regardless of Airfield slope. Speed depends on whether a wheel or three-point landing is intended, whether there is a flat or sloping field, type of leading edge and loading. But 65 KTs is a good base figure, plus or minus 10 KTs depending on what you are up to. The mathematically inclined can work out stall speed for the weight; use 1.3 Stall for normal Airfields, 1.1 for short fields, add 1 Knot for every 2% slope and half the headwind component to allow for gusts. A little experience will soon allow you to pick a figure out of your nose though.

On the subject of slope it is possible to land on some steep places with a few in PNG having sections of around 20%. There are few public road of more than 15% so we are talking steep here. Main points are practice, normal 3% glide, extra speed to cope with a 23% round out, probable max power to make it to the top once on the ground and having somewhere level enough to park at the top. If it is a 400 metre joint at altitude with a tailwind expect a 90 knot groundspeed which requires a strong sphincter but once used to it the slope will wash off speed very quickly. In fact the brakes will hardly be needed and once used to it I worried more about the short flat wet places. Visually these types of landings can be quite overwhelming at first with the combination of high speed and the field disappearing up the top of the windscreen. I mention it because in a single it is good to know what is possible for use in an emergency .

For the inexperienced the best way to land is the three point landing. Same as a nose wheel Cessna, just getting a few inches above the surface and cutting the power poling back, holding full Aft elevator and waiting until the Aircraft stalls onto the ground. A small skip is normal but a big bounce is unlikely since airspeed is lost by touchdown. It is really quite simple and not much harder than landing a 172, especially when light. Starters are best to use this method, keep the back seat empty and land on decent sized fields into wind for the first few hours. Before long they will feel quite confident and wonder what all the fuss is about, in these conditions it is not hard. Downsides are forward visibility is limited, can be hard to touchdown at the desired spot, can damage the tailwheel area when fully loaded, a gust of wind can put you back in the air as can undulations on a rough strip. The latter two and just plain getting it all wrong can cause quite large bounces, often made worse by Pilot input. On a very short field the 3 pointer is best, but requires skill because it is so easy to fall short of the threshold or float down the strip and run off the end.

The other extreme is the wheel landing where the Aircraft is flown onto the ground at a much higher speed with a tail high attitude. With no nosewheel to get in the way once the mains touch pole forward and reduce angle of attack on the wings, this will stop a bounce even though flying speed may still exist. Some even touch down with light pressure on the brakes so on contact the tail raises automatically, can be hard on the tyres. The tail can be allowed to rise quite high at this stage, with the high speed a nose-over will not occur, but it may at lower speeds. Touchdown can be reasonably firm as long as the tail is kept high prevent a bounce, indeed it is possible to get a foot or two above the ground and simply pole forward to achieve a positive landing. Advantages are higher speeds are possible, this is handy at a large field where you may be pursued by a jet and speed is of the essence.
A desired touchdown point can be selected and landed on quite accurately. Forward visibility is good as is braking with all the weight on the main wheels. In gusts the Aircraft is less likely to become airborne again as the required angle of attack has been removed by the tail high attitude. The tail assembly is safe from damage, as it will not touch the ground until later in the landing roll. Disadvantages are that due to the higher speed this method can simply use up too much runway, no good for short field operations. Due to touching down well above the stall bounces can be high and numerous with heavy impacts from them if it all goes wrong. Harder on the brakes due to higher speeds.

The best compromise is what is best termed a tail low wheeler or a 3 pointer without the flare and the tailwheel touching the ground. Approach at say 65 KTs aiming at a point about 50 metres into the field, touch down with the mains at that point in a tail low attitude because the speed is lower than a classic wheeler. Effect the touchdown as described for the wheeler, you can now get the tail back up and get on the brakes to slow down without floating down the strip like a 3 pointer. It takes practice to do well but once mastered is a sound way of landing, especially on rough strips when heavy. Allows a reasonably short landing in control, moderate risk of a bounce and saves the tailwheel and spike as they do not touch the ground until later. If kept straight the 185 will absorb much punishment, one PNG strip gave me a sore back and most other aircraft such as the 206 and Islander needed much extra maintenance, but it never seemed to bother the 185 much. The Ski plane experience with them also bears this out.

As for the bouncing caper it happens to us all, even those with thousands of hours on type. Usually when a group of pilots is watching or you least expect it. Key points are to avoid damage, if the recovery attempt gets out of phase with the Aircraft they will get heavier and larger. Be prepared to go around and start again, if the next landing is done properly there is no loss of pride and fuel is cheap. On a one way strip there may be no option but to ride it out because to power up risks running out of space. Once did this and ended up with turf in the brake disk, scraped the Pod and touched the tailspike on the tailcone. That was with the big 8.50 Tyres too so they really are quite robust! The single passenger vacated via the baggage door and fled into the jungle in spite of the fact this was not the destination. Difficult to describe how best to recover from a bounce, as there are too many variables so I will not attempt to do so. Work it out.

Once on the ground it is understandable to relax a bit, especially if it has been a rough trip. Normal in most Aircraft but a big mistake in a 185. As suggested above they will survive positive arrivals and bounces, within reason and if kept straight. What does the damage and keeps many rebuild shops busy is 185s and 180s that have ground looped. This occurs in the deceleration phase of the landing below about 30 KTs, and many at quite low speed. The cause is failure to keep the Aircraft straight as described in any book on tail wheel handling. Many if the issued raised in the taxi and take off notes arise here as well, but on landing it is much more difficult due to the deceleration. In simple terms giving the centre of gravity

behind the main wheels an inclination to overtake the rest of the aircraft like the Pilot and engine.

The solution is to keep the Aircraft straight, early in the landing sequence this is easy since there is enough airflow over the fin for the rudder to be still effective, below about 30 KTs this will no longer work so that leaves you with just the brakes. At times a little power helps since that gets the rudder working again, but obviously does not help you stop much. As in the take off sometimes the tail can swing around a few degrees for the fin to come into play and hold it there. There can be a delicate balancing act between various forces on a crosswind, which can see some quite interesting crab angles. The key is to keep the feet moving and make numerous small adjustments early to keep on line. This is one case where rapid and full control movements can be quite appropriate if needed. Concentrate on the middle distance, not the bit of ground just in front of the aircraft. The tail is best kept a foot or two off the ground for as long as practical, especially if heavy and on a rough strip. This will keep weight on the mains, improve visibility and reduce chances of problems from a flat tailwheel. A three point landing on a very short field will make this impractical. Seal is much worse than grass, the tyres grab and touchdown with any crab angle gets interesting. If possible use the grass and if low time on type keep the back seat empty in seal for the first few landings.

There is no advantage on having an overly tail high attitude, a risk here is that you will be thrown forward by the deck angle and onto the brakes. Then it will tip over even at quite high speed. Heavy braking should be used early if needed, towards the very end of the roll stay light in the brakes. Excessive use here risks building up material in front of the wheels that can tip the Aircraft on its back at very low speed. Interestingly there is no risk of prop strike as such, by the time the prop hits the machine is already almost vertical and on the way over. Some Pilots prefer to dump the Flap as soon as positively on the ground to get more weight on the wheels and reduce the chance of a bounce. I find it a distraction at a critical phase of flight so do not do this.

Over running the field is the next issue. Causes are using a strip too short for the conditions and load. Landing too far down and running out of room, losing the brakes or finding little or no braking available due surface conditions. Downwind landings are worth avoiding in a 185, it makes directional control quite difficult in the latter stages of landing and needs a long field. Load will increase distance required since inertia equal the mass times the velocity squared. The mass of a 185 can almost double and the approach speed increases as well. Because a small increase in speed means a large increase in landing distance accurate maintenance of the correct approach speed is critical in the final stages. Remember that mountain strip you visited alone may be short at one end with a few mates and a couple of crates of beer on board. Landing at a point on the field should be practiced, even if it is long enough not to matter. Then when required the skill is there. As noted earlier check the brakes are in top order at all times. One big trap is a poor braking surface. Damp clover and Lucerne, newly cut crops, moss, hay, saturated turf and wet smooth seal can all provide next to no braking. Often it is not possible to determine this from the air so if uncertain have a good look, get the speeds back and don’t waste any runway. In these conditions bigger tyres are worst for braking, as they will not dig in and break the surface.

As with a take-off after a certain point there is no option but to land. In bush operations this point can be on turning finals and on a short level strip with a go around it is around the normal touchdown point. Try one on a medium size field and it can be surprising how much room is needed with a full load. Often a landing will go wrong and the Pilot attempt to go around far too late in the game. The result is a higher speed crash that may hurt, where otherwise there would have been a low speed impact or none at all.

Cross wind technique is as for any other Aircraft but the limit is lower, around 12 KTs. A wind from the right is much more manageable than one from the left though. By turning into wind on a wide runway at the end of the landing it is possible to handle a much higher limit.

Emergencies

Mostly the standard engine failure drill for forced landings. One idea if forced to put down in a very small clearing or beach is to Pole forward and lock up the brakes as soon as firmly on the ground. This will flip the Aircraft and it will stop in a short distance with relatively little damage. The occupants should be safe from harm with the wing below and the Tailsection to absorb any impact. It would take some nerve to actually do this but in theory it sounds like a good idea. Partial engine failures are actually more common. Mainly Magneto failures cracked Cylinders and blocked Injectors. In all these cases the engine will run with some vibration but performance will be affected and it may not be possible to remain at high altitude. Remember to use the electric fuel pump if an engine failure occurs, often the problem is the fuel control unit or mechanical pump. Early models did not have fuel selectors, the only real use is to isolate a leaking tank. So Pilots who have flown a machine without them can easily forget they exist, being out of sight as well. It is then possible to fly one which does have them and suffer an engine failure if only one tank is selected. I know this because it happened to me. Even if the mistake is realised and the tanks changed it takes a little time for the engine to catch again. This is due to the One gallon header tank on the floor, so check those selectors.

Maintenance

Some notes on common maintenance snags which often occur. These are mainly related to Cylinders, brakes, fuel cells and the tailwheel.

The cylinder barrels are steel with an alloy head, so after a few thousand hours they can crack around the join and in extreme cases the head can separate completely. There will be significant vibration when this occurs and some oil loss, but the engine will still run and allow a landing somewhere unless you are having a very bad day. The cause is thermal stress as the different metals expand and contract at different rates when heated and cooled. So it is the rate of change of temperature as much as the actual CHT. Use the cowl flaps, sensible mixture settings and try and make smooth changes in power settings. Even given careful operation though they will still crack with age.

Greatest temperature change ever is after shutting down with a brisk cool breeze blowing through the cowling. Close the cowl flaps and consider blocking the front intakes in these conditions. Most likely you will have a plywood bird blocker for the air intakes anyway.

After about 1500 hrs cracks become reasonably common and after about 3000 hrs just expect it and have a spare one in the Hanger. This depends on type of use and engine handling. Oversize Cylinders are the worst as the walls are thinner and they are older, which is why they have been bored out. Ideally new ones would be fitted at every full overhaul as Lycoming suggest, and their Pots are better than the TCM ones. That would be quite expensive though, the best compromise may be to buy new when one cracks instead of going for a repair. There is not a great price difference now. Mostly these cracks will show up on a compression test rather than causing problems in flight. It is largely a matter of inconvenience due to downtime and the remote spot fate will force you to land on. I once had a bad vibration in flight and all compressions on landing were good. The cracks can close up again when cooler; this cylinder blew 50 Hrs later and stranded me in a remote area. A further threat is carbon Monoxide poisoning if gas escapes from the crack and finds a way into the heating and ventilation system. Once had this and was lucky it was a short flight, it is

very insidious and extremely dangerous. So keep the exhaust, heater system and Air hoses in good order too, mine were very ordinary at the time.

Fuel Cells, Caps and Drains can be real problem. All 185s are old enough now to have trouble with rubber fuel cells. With age the outlets pipes become hard, crack and leak. Apart from the Fire hazard the mess is considerable. The black stuff in the lining can also peel off and block the fuel system and ripples can make it hard to get any water out. When this happens it is time to install new bladders, they are not much more expensive than reconditioned. Fibreglass tanks are also available.
Either way do not mess around with the old ones when they give trouble, just not worth the drama.

The old flush fuel caps are a hazard. The O-ring can let water in and they will not run on water. I took off with a pint of water in the system and the engine stopped 19 minutes later when on high finals, coasted in. The fuel check had revealed 100% water so it looked clear. Raised Caps should be installed by now. If not do so; they are quite cheap and very worthwhile.

Fuel drains can stick and stay open after checking for water. Standing alone on an Airfield on a cold morning with a thumb over the drain and Avgas seeping down to the armpit, wondering what to do next, is a low point in life. So keep a spare one on the glove box, along with a spanner. Failing that just a Stud the right size to block the hole will do.

On rough or soft field operations the tailwheel can cause problems. Standard ones are a little small and tend to dig into the ground, and suffer flat tyres. Tailwheel shimmy can be a major problem. If on landing the Panel turns to a blur and the Pedals try and break your ankles, that's it. An overhaul of the Tailwheel shimmy dampers is the solution. Pilot technique can also reduce this by keeping it off the ground and with a larger tailwheel as well these problems should all but disappear. Gives better visibility out the front as well. With no load it is possible to fly to the maintenance base and hardly use the flat wheel. Elevators, brake and power will keep the tail up even from a standing start and to a dead stop. Take care not to tip over though. Also with heavy use the tail spike can fatigue and break. They are hollow so if stuck find a 3/8 reinforcing rod, weld a plate on one end for a skid and bash the other into the hole. That will get you home.

Some operators fly more than they write. There is little if any advantage in understating hours in a 185. None of the Airframe parts are time limited. Most engines require a top overhaul at half life and again at around 1700 Hrs, this will usually occur regardless of what is in the books. Often money will be wasted on a worn engine because the logbook says there should be life left in it. The big mistake is to delay oil changes and run over the 50 Hour limit. With mineral oil there is a good argument for changing at 30 Hours. At this stage it breaks down, goes black, consumption goes up and lubrication properties rapidly reduce. I know an agricultural operator who changes at 30 and the engines are very clean and show little wear at overhaul time. Some modern synthetic oils should be good for more than 30 Hrs. With a quick drain sump an oil change is quick, cheap, and can be done by the Pilot. In a cool climate where temperatures get below freezing at night a simple oil heater like a light bulb will greatly reduce engine wear on start up. Otherwise it flows like syrup and takes some time to reach the top end. Really cold climates like Alaska are a specialised area I know little about, apparently they take the Oil out at night and keep it warm somehow.

Modifications

As mentioned earlier these Aircraft can be customised according to what they are used for. If this is carried to far though it does pose the question of weather it is the right type at all. For example buy a Centurion for speed and a Beaver for heavy-duty short field work. For lighter

strip work look at a Piper Cub (A classic!) ,.170 if you can find one or even a tailwheel 152. An easy to fly personal Aircraft with the same performance is the Cessna 182.
Most useful add on is most likely Cargo Pod. These allow room for 6 people and the bags or just more Cargo. Cruise speed is reduced by about 5 KTS and more in the Descent where Airspeed will not get far into the yellow Arc. If it all goes wrong and one of the gear legs is ripped out, the Pod will prevent much damage that would occur otherwise. If however it is a private Machine and you can get all your friends and relatives in the back of a Piper Cub with a spare seat, a Pod will not be needed.

Leading edge and wing tip Mods come in various shapes and forms, they improve low speed handling. Most work well; it really depends on whether the extra cost and weight is justified. The old symmetrical leading edge may not be the best on paper but does give plenty of warning of a stall. Bear in mind that an airspeed of 35 KTs, which is possible with these Kits, is faster than that since the indicated and actual airspeed diverge at these low speeds. Also the Stall when it arrives can be quite sudden. At high altitude lower approach speeds cannot be used safely since the power needed may not be available, this is more a feature of the Islander with its 39 Kt stall. Be aware of gusts at low speed. A 20 Kt wind at 60 KTs is a third of Airspeed, come back to 40 KTs it is half. My point is to question whether an approach much below 60 KTs is a good idea regardless of stall speed. But if used as a safety buffer for bad days leading edge kits can be a great asset. Would have ended myself in the PNG jungle back in 92 without one, this is a pretty hefty recommendation come to think of it. Presumably they also help the Aircraft blow off the pickets in a gale The only wing Mod that does not make sense is Flap gap seals. Fowler flaps work by allowing the air to flow from the top of the wing under the flap, so preventing this does not seem sound. I have doubts about very droopy wing tips as well, any aerodynamic benefit must seem small after hitting the head on one.

Tyre size can be varied up to 8.50 on the standard rim; speed will be reduced but most useful on sort fields. Go easy on the brakes though, on a sealed runway tyre creep can occur with big tyres at low pressure. Wheel spats increase speed by about 5 KTs and can make up for that lost by a Pod. They also keep the bottom of the wing clean and make a good step. But they can harbour quite a bit of Mud or Ice adding up to quite a weight. Plus some people think they just do not look right on a 185, but the rest of the Cessna range have them. Small tail wheels can be replaced by bigger ones if they are not up to the job and I think stronger tail springs are available as well, have seen one somewhere.

Early models did not come with refuelling steps and handles on the strut and forward of the doorpost. These are most useful and well worth adding, saves falling off the strut when nothing else is available. As mentioned earlier grab handles in the aft end will reduce the chance of ground handling damage on the skins and elevator.

Inside just a couple of really handy things. Articulated seats in the front allow adjustment from desired position on the ground to see out to that in cruise with the tail up. They go up and down as well making them a must for short, stumpy, sawn off and vertically challenged people. Inertia reel full Harness seat belts for the front, or even just for the Pilot side, are worth a look. The Passenger can use a fixed full harness and I have used one on the Pilot side as well. In a 185 though it is essential to be able to reach the Flap lever on landing, just when a crash is most likely. A fixed harness does not allow this and has to be loosened off for landing, kind of missing the point. Single diagonal shoulder straps and lap straps only are next to useless. These Aircraft have a very strong Cabin areas in a crash so proper belts to prevent head injury are well worth it. In high risk work and heavy turbulence a light helmet can have a place if there are no passengers.

Avionics are a matter of choice. With GPS now the basis of it can be a good GPS/ Com with a back up radio. Many Aircraft are full of old obsolete Nav gear that often does not

even work. In my opinion it clutters up the Panel and all needs flung out to save weight. Autopilots may be useful if a great deal of IFR flying is done but most 185s tend to be VFR and fly quite straight on their own.

Noise is an issue in the clean green new century and the 185 must be the noisiest aircraft for its size in the world. It is mainly to do with the Prop Tips; these go supersonic creating that distinctive scream on take off. Apparently there is little advantage in the long two bladed Props over the 82 inch one. There may be a Mod to cut the 86 and 88 inch ones back. For Parachute work where noise is a real issue a modern 3 blade Prop offers a significant reduction. As do the old 3 blade ones but these have a slight performance penalty. They offer better ground clearance and with a Pod on may not even touch if a leg is ripped out. Mostly common sense actions such as avoiding built up areas, whinging trampers and keeping the RPM down will help our case and reduce the chance of restrictions.

If on the other hand you think stuff the poor and let them go deaf while burning as much of the worlds oil as possible get an 88 inch prop with the 300 HP motor. Dunno if it performs any better but the whole province will know when you are off somewhere, the noise will wake the dead on take off and climb.

The Missionary Aviation fellowship has two good mods that I have only seen on MAF or ex MAF Aircraft. One is an emergency fuel system, when activated this puts fuel directly into the intake manifold. Thus most of the fuel supply system failures can be bypassed, it will get you home. The other moves the battery from behind the cabin to the left hand front of the firewall. The movement in C of G must be considerable and most useful where the Aft compartment is used. If flown light perhaps not a good idea. A 185 can have a forward C of G with just the Pilot on board, not a big problem but increases the chance of tipping over. The one I knew with a forward mounted battery did just that. These are just some of the mods available, they can all have a place just beware of gilding the lily so to speak.

Currency and training

Sometimes 185 owners will have a few bad experiences and avoid flying them unless they have to. This is not sound thinking as currency is important. If privately owned the extra cost of flying them is minimal, most only do about 100 Hrs a year and some less. For maintenance and proficiency reasons it is better to do 100 annually at least. The extra cost from say 50 to 100 is not much more than the fuel since the engine will run out on calendar time and they need an annual anyway. Insurance is a fixed cost and should actually be cheaper for those who fly regularly. Looking at privately owned Aircraft in New Zealand few of them will ever wear out but the fleet has an abysmal record of landing accidents. Indeed almost all of them have been crashed at some point supporting a case for better training and currency.

Currency on its own is not much use if the skills being practiced are not appropriate. So Training is important, most Private owners and some Commercial Pilots receive little more than a bare endorsement and so blunder along learning a little more with each fright until they master it or not. I know this because that is how I learnt to fly them prompting these notes. Most Private owners are quite good Pilots and need to be keen on the Aircraft to own them, but should consider independent experienced advice from time to time on how the machine is flown and used. Properly done this can be a fun and educational thing that will increase confidence Otherwise it is possible to start doing strange things and not realise if operating alone. Certainly a 185 is not for the faint hearted but once mastered it is really not that difficult and for the most part is great fun.

At the other end of the scale over confidence can be a problem. From time to time some character will decide to `show us what you can do in a 185', but push the limits too far and metal will bend eventually. It is this group that tends to have the very serious high-speed

accidents. Sometimes the question is not whether something is possible or if the Pilot has the skill, but if it is a good idea. An example is landing at a marginal spot if a good one is only a few minutes drive away.

For some reason Fatal accidents are rare so while the landing accidents go off the graph they appear to be one of the safest single piston aircraft. Possibly because a certain amount of skill is needed just to get airborne so the truly incompetent stay away. Plus it is a strong airframe with good climb performance but not the high speed in cruise and descent of a high performance retractable that can get people in trouble. Will give the soapbox a rest now.

Hope these notes are useful, it is not what you know that will cause trouble, but what you do not know. Above all, enjoy flying these things that is what it should all be about.

Postscript.

If anyone thinks these notes are useful use them, add to them , pass them on or whatever. I do not pretend to know all about the 185 and my experiences may vary from others. The landing section did not get across what I was after but that is the best try. Have a boring airline job now and looking at the completed notes realise it really **is** a Cowboys guide. Would not attempt those 1000 hours again and must be living proof that ignorance is bliss, as I enjoyed it all at the time. Now 500 hrs can go by without a flicker on the pulse. While intending to be anonymous in case some prick sues me for crappy advice my Email is Dsarg@Hotmail.com. Due to junkmail it may not work.