



Theory Brief 6c: Landing

Aim:

“To be able to land the aircraft safely and consistently no matter the conditions.”

Objectives:

1. To appreciate the importance of a planned landing approach.
2. To be able to land the aircraft without accepting risk.
3. To be able to adjust the landing to compensate for landing errors.

Learning to Land an Aircraft:

Pilots jokingly say “Any landing you can walk away from is a good landing. An even better one is when you can use the aircraft again.” In reality this is true only if you are performing an emergency landing and not on a runway.

Landing an aircraft is singly the hardest skill to acquire for the student pilot. You are in close proximity with the ground, and for the first time you can see exactly where the aircraft is in relation to a runway, so flying accurately is easily measured, and as the tolerance between a good landing and a not so good landing is very small, your skills will be found lacking in the early stages of this exercise.

The steps required to land an aircraft

- You should always land into wind. **Tail wind landings are dangerous.**
- You must be at the right altitude and position late downwind to ensure repeatability of the exercise.
- You must transition to slower flight (70Kts with 1 stage flap) correctly and smoothly.
- You must control the aircrafts speed during the descent at 70Kts using attitude control.
- You must control the rate of descent by using power smoothly and in small increments (as little as 50 RPM)
- Do not over turn or use excessive Angle of Bank.
- Radio call declaring “Turning Finals RWY XX – Full Stop / Touch and Go
- Turn onto the centreline of the runway when turning final.
- Stay on the centreline no matter what the wind is.
- Control the descent by looking at an aim point approx. 100m into the runway.
- Check the windsock prior to committing to a landing so as to ensure you know what the wind is.
- Hold off just above the runway (smoothly) and not over rotate (you must fly level down the runway).
- Straighten the aircraft prior to landing.
- Look up at the end of the runway to have a reference point for landing.
- Once in ground effect, raise the nose slightly so you land on the main wheels only.
- On touch down – reduce power to full idle.
- Keep the nose up during the roll out.
- Keep the aircraft straight during the roll out
- Once landed and slowed down sufficiently, you can go into taxiing mode.

Common mistakes during landing

- Too fast or too slow in the approach.
- Too much or too little power “over the piano keys”.
- Not on the centreline.
- Hold off too high.
- Not looking up at end of runway to get a reference point.
- Reduce power to soon or too quickly.
- Not level the wings prior to landing.
- Not straighten the aircraft prior to landing.
- Raising the nose too high during landing resulting in adding altitude (Ballooning).



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Poor Landing Recovery

Recovery techniques are required when you don't quite get it right.

The most significant issue is holding off too high, or raising the nose too high as you will end up too high above the runway with little airspeed, reduced control and a rapid rate of descent when the wings produce reduced lift as you near the stall. Another important issue to consider is not landing straight.

Recovery Technique

Recovery is a matter of simply adding some power to delay the landing until you are ready and prepared again to commit to the landing. For a slight balloon or slight over rotation of the nose only a small increase in power is needed. This is another reason why power control must be precise and smooth.

Fly the aircraft into ground effect, get stable and then reduce the power to commit to the landing.

If this point is not reached prior to the mid point of the runway, you should add full power and abort the landing attempt.

Go Around

If a Go-around is needed, apply full power and commence climbing. Retract the flaps to 1 stage of flap.

Move to the dead side of the runway.

Turn to re-join the circuit over the keys at the end of the runway onto cross wind. Once stable retract flaps to clean and re-join the circuit mid field down wind, using radio calls to alert other aircraft.

Safety (Airmanship)

It is very important to remember these principles:

- **Attitude controls airspeed – Power controls rate of descent.**
- **Check the wind sock prior to landing. Only land into wind.**
- Keep your eyes outside the cockpit as much as you can to see where you are flying and maintain your position as described by the instructor.
- Err on the side of caution, if you are not happy – Go Around.
- Do not land if another aircraft is using the runway.
- If you have not landed by mid-point on the runway – Go-Around

Cross Wind Landings

It is necessary to land in a crosswind situation especially at Bindoon as we only have one runway, and the wind is not always East / West.

- If landing with a cross wind, keep the wings level and crab the nose into the wind to stop sideways drift off the centreline of the runway.
- Fly down in the normal manner and hold off as normal
- Prior to landing, straighten the aircraft (using rudders)
- Some opposite aileron control may be required to prevent the further effect of rudder (Roll in the direction of rudder input)
- If you detect some drift, lower the into wind wing slightly to prevent drift from becoming excessive.
- Get the aircraft stable in ground effect prior to landing.
- If in doubt - Go- Around.

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Wind Shear

Wind Shear is a condition of two separate layers of air sliding over one another, causing a sudden reduction in airspeed as you descend from one layer to another.

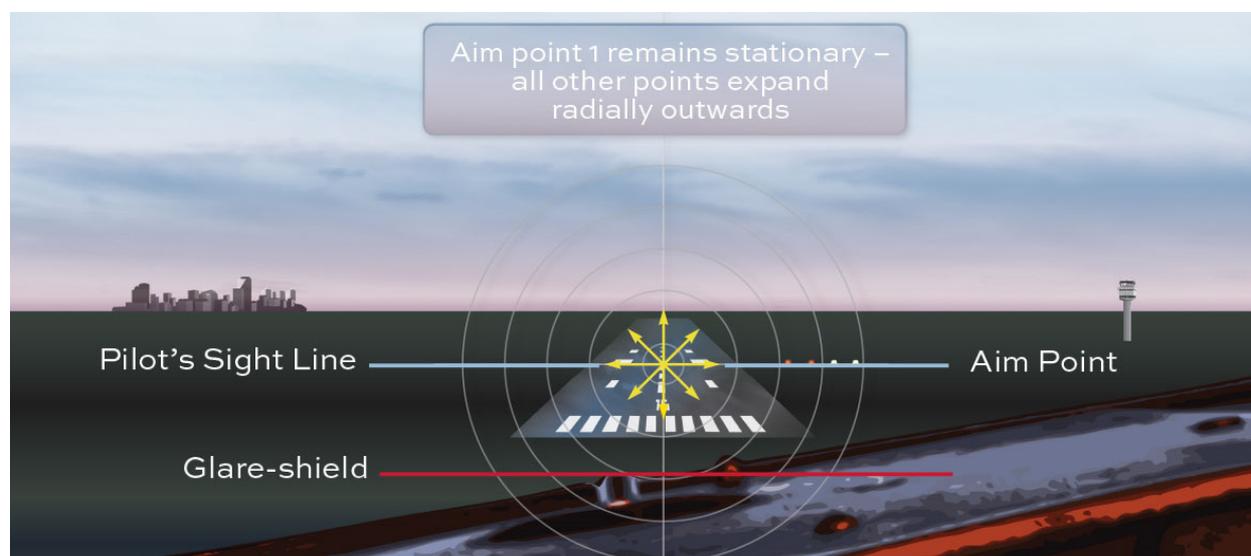
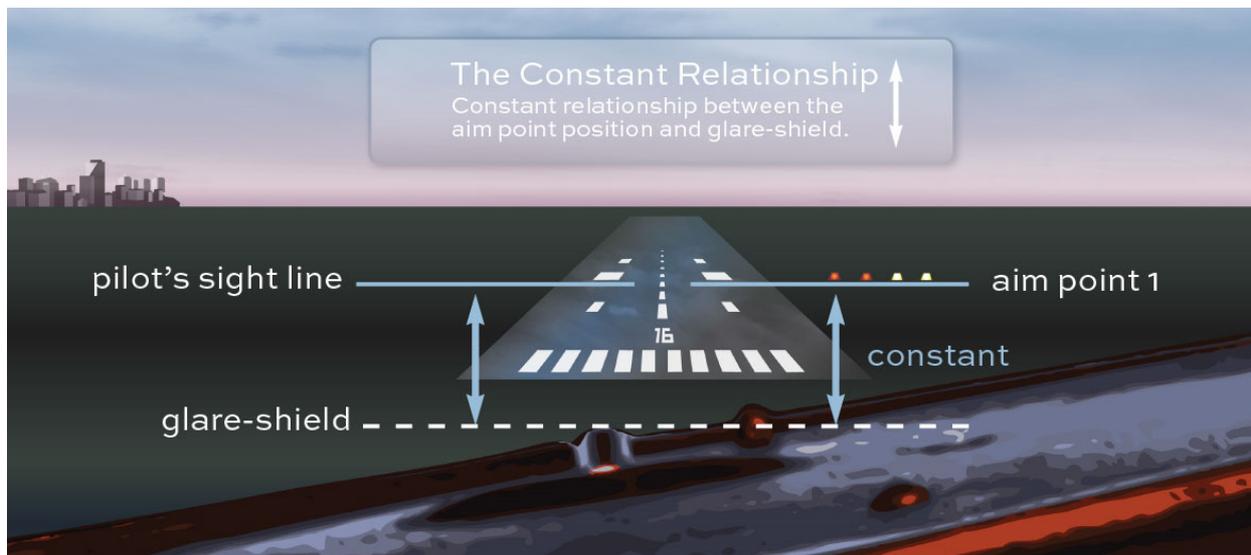
The reduction in airspeed can be significant. (+10Kts or more)

You will experience a sudden increase in the rate of descent, and an instantaneous reduction in airspeed.

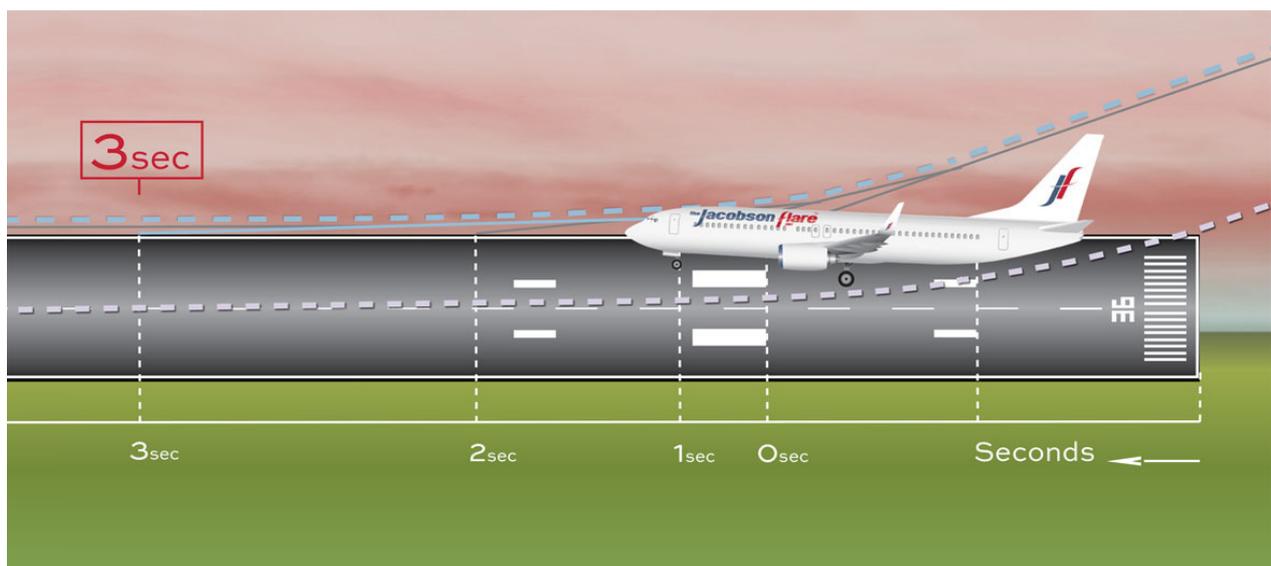
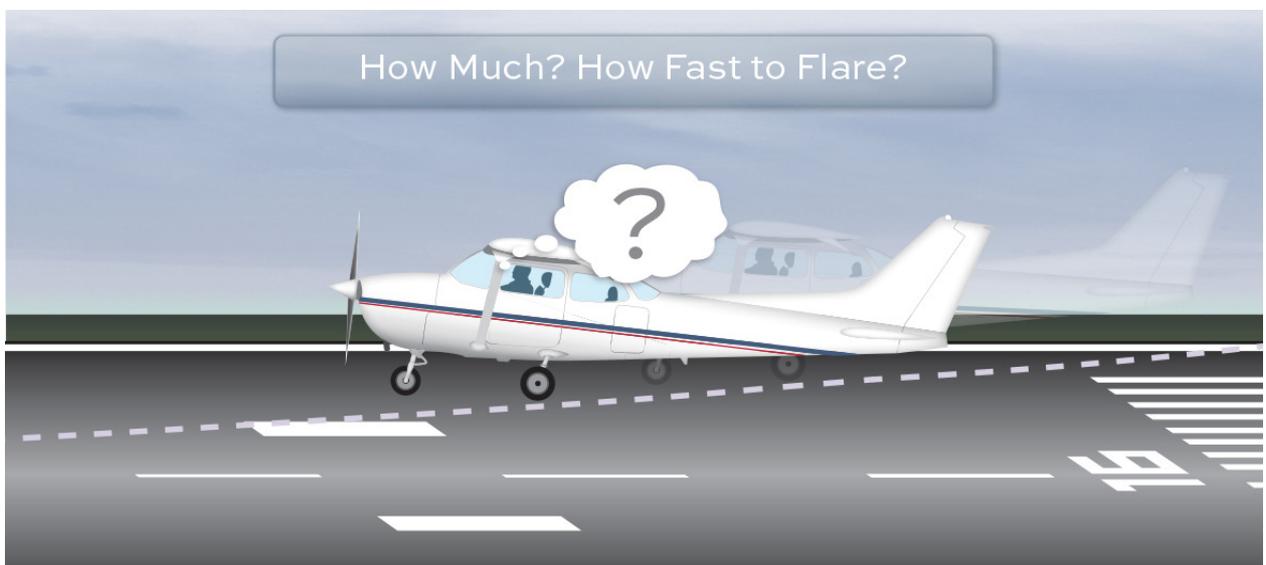
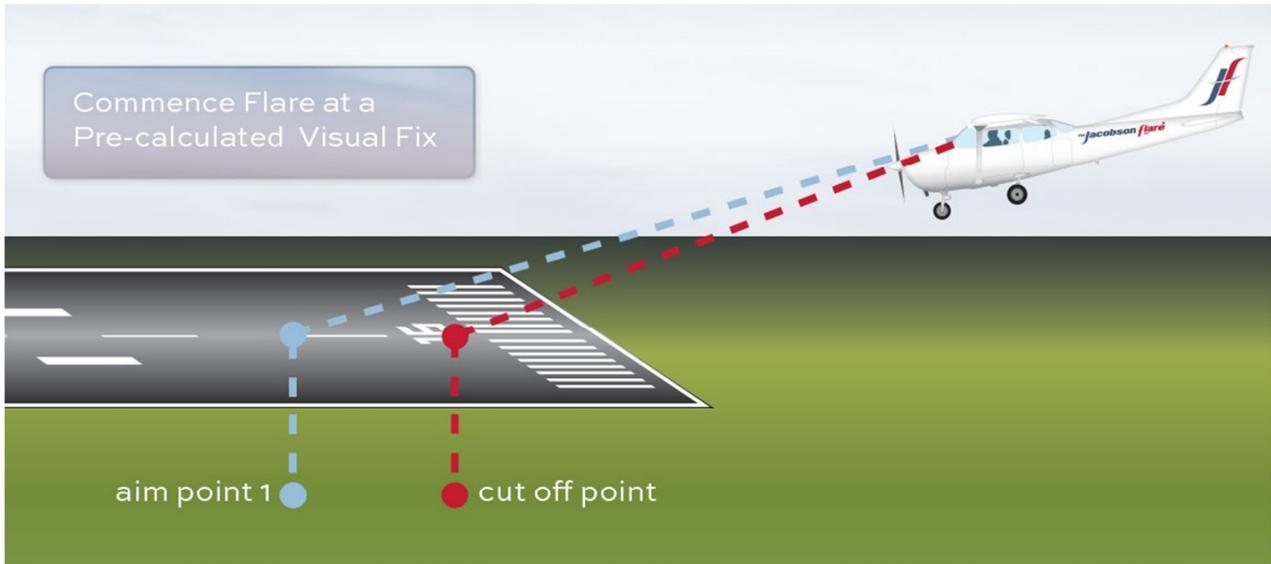
Wind Shear Recovery

Immediately LOWER THE NOSE to recover lost airspeed and APPLY FULL POWER as QUICKLY as you can and ABORT the landing attempt.

The Jacobson Flare Landing (<http://www.jacobsonflare.com/>)



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