



FIRST FLYING TECHNIQUES - APPROACH AND LANDING

1. Introduction

We aim to teach and demonstrate how to operate a general aviation aircraft and show some basic techniques and manoeuvres that every real pilot must have learnt to be licensed.

In this document, we will learn how to establish our aircraft into a stabilized approach and to finally land on a desired airfield safely.

We use the Cessna 172 as training aircraft which is also a default aircraft in most flight simulators.

Understand we are not learning to fly the Cessna 172 specifically.

We will not review specific practical aspects about this aircraft.

2. Theoretical Knowledge

2.1. Approach

First, we will lead our aircraft into runway axis at a height of 1000ft.

We plan to be aligned with the runway axis at the latest at 5 miles from runway threshold in order to have time to reduce our speed toward landing speed by extending our flaps (All of this will be detailed in the practical part).

Flaps extension sequence, approach and landing speeds may differ considering the aircraft you are using.

Flaps extension must be done progressively, paying attention to their maximum speed use.

Extending flaps will have consequences on our aircraft behaviour.

The sudden increase of lift will lead you to adapt your pitch and you will need to trim again the aircraft.

In this kind of light general aviation aircraft, we will try to descend along a **3°** slope.

We can use a visual guidance system to help us.

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2.2. Landing

A good landing is performed by leading your aircraft at the right airspeed, at the right rate of descent and by being the most possible aligned on the runway centreline.

A few feet above ground, we will put throttle on idle and raise slightly our nose until we land.

For safety reasons, you may need to interrupt your approach or your landing.
To go-around, proceed exactly as if you were taking off.

Contrarily to the popular belief, a kiss landing is not a perfect landing.
Kiss landings on medium and heavy aircrafts is a precursor to runway overrun.

3. Practical Aspects

3.1. Approach

We consider that you have been able to find a runway and maintain a height of 1000 feet in straight level flight thanks to all the previous documents.

Try to be aligned as much as possible with the runway centreline.
At this point, you should be not too fast, between 90 and 100 knots. Flaps are up.

- Imagine a line representing the centreline of the runway. Like for the taxi, try to keep it at the centre of your vision field.
- Notice the red lights on the left side of the runway. This is called a PAPI and it is the visual guidance we have been talking about earlier.



The PAPI works as follow:

- 2 red and 2 white lights: perfect (or one red and one white in case of 2 lights PAPI)
- More red than white lights: too low
- More white than red lights: too high

We always try to perform an approach by being too low at the beginning.

It is possible to perform an approach by being too high but it is a high source of missed approach.

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The next step is to prepare our aircraft for the approach.
Slow down below 85 knots and extend gradually your flaps.

Remember that you will have to trim back your aircraft and adjust your power.



When the PAPI shows two reds and two whites, initiate the descent.



At this point, you should try to keep these parameters:

- Target speed: **66** knots
- Deploy flaps progressively to **30°**
- Descent rate for a 3° approach is 5 x Groundspeed, so vertical speed: approx. -350 ft/min
- PAPI set to two red lights, two white lights

If you need to perform corrections, do them gently, with only small input on the flight control. Normally, you don't need the full scale of the flight control in this flight phase!

As you continue your approach, for a successful descent, your vision of the runway must no change. It must just be enlarged as you get closer.



Look with attention: as we fly toward the runway, it is like we are zooming on the runway.

If you see the runway slowly drifting upward, then you are descending too rapidly.
If you see the runway slowly drifting downward, then you are descending too slowly.



Follow with attention to the following flight parameters:

- Speed: 65 kts
- Vertical rate: 350 ft/min
- Pitch: -2°

Only apply small corrections. Don't forget to manipulate your throttle lever simultaneously to maintain a stabilized airspeed.

Finally, remember to trim your aircraft to stabilize your approach.

3.2. Landing

When you are approaching the ground, if you decide to land, it will be time to flare in order to hit the runway softly for you, your passengers and your aircraft.

If for some reason you are in no position for landing, or you did not receive a landing clearance or something obstruct the runway, you must perform a go-around.



Remember that you need to simply raise the nose of the aircraft of few degrees. To maintain runway centreline, such as for take-off, look at the end of the runway.



4. Conclusion

This document concludes our series of documentation about first flying techniques. Approaches and landings are the most demanding maneuvers and require a lot of training. Do not hesitate to train in particular these two exercises.

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