



Landing Fundamentals

By Kevin Crozier

One of the most challenging parts of flying is the last part of the flight: landing. We haven't left an airplane up there yet, but all pilots seem to have "bad days" when it comes to landings. When I get stuck in a bad-landing rut, I go back to the fundamentals and try to figure out the root cause. Here are the landing fundamentals I teach and follow no matter the airplane.

Fly the pattern the same way every time

If you do something the same way every time, you should get the same result. The key to smooth, consistent landings is a consistent traffic pattern. Every downwind should use the same power setting. You should put the gear down at the same place (I use midfield), and the flaps at the same place. However, like everything else in aviation you will have to adjust based on weather conditions, traffic in the pattern, etc. In the end your goal is to ensure that you are making minimal corrections on final. Remember that each configuration change will likely result in a trim change. In my case, as soon as I put the landing gear down, I am adding nose up

trim simultaneously – it's okay to get ahead of the airplane. This helps ensure a smooth ride for your passengers and minimizes the speed and pitch excursions in the pattern.

Fly the right speeds on each leg

Know the speeds for your airplane on each leg of the traffic pattern. In a heavy A36 Bonanza I fly 120 knots approaching the pattern, 110 knots on downwind, 95 knots on base, 90 knots on final, and 85 knots over the fence slowing to 80 knots over the runway threshold. These airspeeds will be slower for lighter V-tails and Debonairs.

To find these speeds for your airplane, a good place to start will be the speeds on the Landing Distance chart (see **figure**) of your POH's Performance section. This

LANDING DISTANCE		
WEIGHT ~ POUNDS	SPEED AT 50 FT	
	KNOTS	MPH
3600	72	83
3400	74	85
3200	76	87
3000	75	86
2800	73	84

gives you the suggested speed at 50 feet above ground level as you cross the runway threshold, with full flaps, adjusted for the current weight of the airplane. Keep in mind, your airplane may not precisely match the POH performance, but in general the recommended speeds are 1.4 V_{SO} (stalling speed in the landing configuration) for base and 1.3 V_{SO} for final. What is V_{SO} ? It depends on your airplane (and weight), so go out find it. Take a flight in your airplane, climb to least 3,000 feet AGL and configure it for landing (full flaps and gear down). Then raise the nose to the flare pitch attitude and note the speed at which the airplane stalls. Multiply that speed by 1.3 and you have the "book" short final airspeed. You now can derive base leg and final approach speeds for your airplane (at that weight) that help you attain the 50-foot speed on short final. Flying at the right speeds help avoid float, ballooning, and spending as little time possible in the "uncomfortable" zone between flying and rolling out.

Raise your eyes and look at the far end of the runway

This is absolutely key for smooth flare. If you don't shift your eyes and instead continue to look at the runway right in front of the airplane, you have no means to judge your height above the runway. You will likely balloon in the flare due to the ground rush (the perception that the ground suddenly accelerates toward you as you get very close to it). When I am struggling with my landings this is usually the cause. To fix it I will do some pattern

work, consciously telling myself to raise my eyes and look for the end of the runway in the flare.


Keep flying the airplane

Once you are in the landing flare, keep flying the airplane. Don't give up on maintaining the centerline just because you are a few inches off the ground. If you find yourself sliding left or right of the centerline – fix it with aileron. If the airplane isn't pointed straight down the runway – add some rudder. Finally, if you feel like you are a little low on energy, add a squeeze of power (and then take it right back out) to cushion the touchdown. It's up to you to maintain positive control of the aircraft all the way to the hangar.

Don't be afraid to go around if it's just not right - you need the practice!

In the end, if it doesn't feel right, look right, or smell right – go around. If you have to ask yourself, *why are we doing*

140 knots on base? or you are more than one-third of the way down the runway and the airplane isn't ready to land, go around. That "something off" could be that the landing gear isn't down. You may be too slow and will land short of the runway. Or you may be too fast and roll off the far end. There is no shame in going around, and it is *always* better than a flat tire, bent airplane, or worse. In fact, you probably need to practice more go-arounds anyway. I bet you haven't done a go-around in a year or more – check your logbook.

Hopefully, these tips will help you get your landings back on track. If you are still struggling, grab a BPPP instructor and go flying. A qualified CFI will be able spot your errors and get you back to the landing fundamentals. 

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