

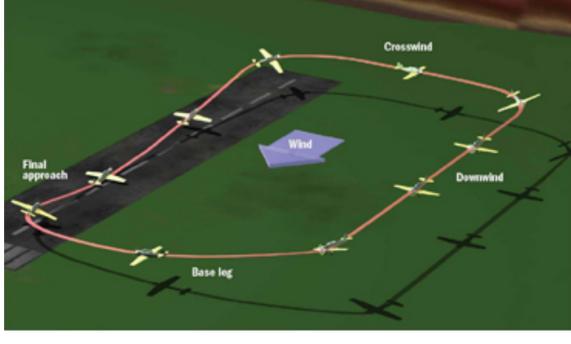
# Land Like A Pro

Friday, January 1, 2016 11:13 AM

We've all heard the old adage, Takeoffs are optional; landings are mandatory. Bringing a plane back to the ground safely is a pilot's top goal. Unfortunately, one of the hardest maneuvers for an RC airplane to perform is the landing, and it is the first one that we pilots must learn to perfect to keep our models intact. How should you get started? Read through these tips, and then go to the field and practice!

## FIRST THINGS FIRST

To ensure a good landing, the first thing you have to do is trim out the plane so that it flies with a predictable sink rate at slow speeds. If you cannot slow down the model, you have no hope of ever making a successful landing. Start at a relatively safe altitude, and bring the throttle stick back so that the engine slows down and the plane begins to lose altitude. You will have to feed in some up-elevator to increase the plane's level angle of attack. If you continue to feed in up-elevator, the plane will eventually enter a stalled condition and will either drop a wing or fall forward. Practice entering and exiting this stall speed so that you know the speed at which the plane will travel before it enters the stall. Now you know your plane's slowest speed; this is the speed you want just before touchdown. Knowing how to control your plane's speed so that it can fly with a predictable sink rate and land at the slowest possible speed is the first step toward perfecting your landing.

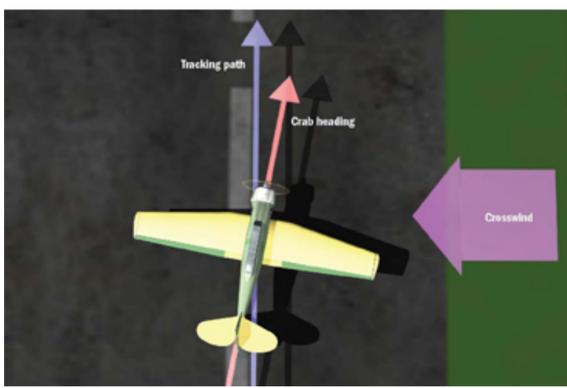


**A good landing starts out with a good landing traffic pattern. Start your landing pattern by entering the crosswind leg and then turn into the downwind leg. Turn into the base leg, start your descent and then set up your final approach. All your turns should be 90 degrees.**

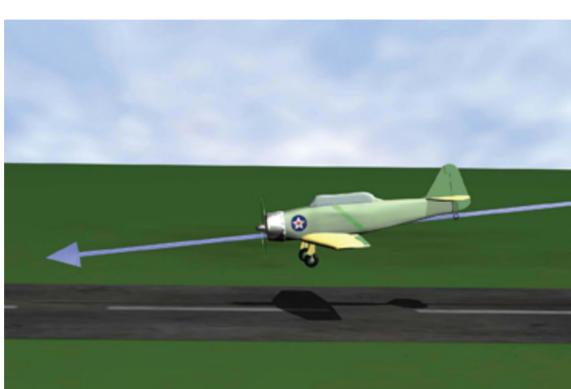
Using a landing pattern contributes to your touchdown's perfection; emulate the same landing pattern that full-size aircraft use. Start by traveling into the wind and away from you. Your landing pattern will have a rectangular shape with four distinct 90-degree turns. Enter your first turn, and travel the upwind crosswind leg of the landing pattern so that the plane has about 100 feet of altitude. Your second 90-degree turn will also be in the same direction and should set up the downwind leg so that the plane will be traveling parallel to the runway on the opposite side of the field and away from you. Fly the plane straight and level until it enters a spot directly in front of your location; then reduce the throttle to about 75 percent and begin your descent. Execute another 90-degree turn in the same direction, and begin flying the plane into the downwind, crosswind, base-leg descent. You should reduce your throttle to about 50 percent and let the plane's altitude drop to about 50 feet before you turn into the final 90-degree turn. Remember to use the throttle to control the rate of descent and the elevator to control the speed. At your last 90-degree turn into the final approach, have the plane lined up fairly well with the runway; you can make minor adjustments along the way to touchdown. Now the plane will head into the wind, exactly as it should. Depending on your plane, the throttle should be reduced to somewhere between 25 percent and idle. Most importantly, remember to keep the wings level on the final approach. Use your rudder to move the plane left to right, and line it up with the runway; use the ailerons only to keep the wings level. Aim for an imaginary spot just above the end of the runway. When the plane is lined up, it should cross the end of the runway at about 10 to 15 feet above it.

## THE FLARE

Just before touchdown, all pilots have to perform one of the most precise maneuvers known: the flare. The flare requires exact timing at the moment just before touchdown so that the plane lands softly without bouncing back into the air. The height at which you should flare varies according to the plane you're flying. Pull back on the elevator, and raise the nose of the plane just enough to slow it down; then perform a stall with the wheels barely above the ground. If this is done correctly, the plane will softly greet the runway and do a smooth rollout. If it's done too soon, you risk tip-stalling the plane and having one wing touch down before the wheels, thereby causing a spectacular cartwheel down the runway. Or, the plane could drop onto the runway and spring back into the air with little or no airspeed. If you flare too late, the plane could also bang down on the runway and bounce back into the air with little or no airspeed. Being in the air with no airspeed is a sure-fire recipe for disaster! If you do find yourself in this predicament, it is best to add power and fly around for another try. That's all there is to it; almost any plane can land following this approach. Heavy-scale planes and fast jets require more speed for landing than slow, high-wing trainers. This is why the first step in our process—practicing slow-speed stalls with altitude proves so valuable in discovering a plane's stall speed. Every plane is different, so be sure to do your homework here.



**In a crosswind landing, you should set up a crab heading angle that produces a straight tracking path. The stronger the crosswind, the larger the crab angle needs to be.**



**A smooth and consistent approach angle is also very important. Use throttle to control the descent rate and keep the wings level. Aim for an imaginary spot just above the runway, and cross the end of the runway at an altitude of about 10 to 15 feet.**

**Thinking backward.** Many pilots encounter problems when the plane is coming towards them, and all of the controls are reversed. Over time, this becomes second nature, but in the beginning, it can be quite bewildering. If you are just learning how to land, try to keep in mind that when the plane is coming towards you and one of the wings drops, you'll have to move the aileron stick in the direction of the lower wing to raise it up. Remember, when the plane is coming towards you, you are looking at a mirror image of it. Left becomes right, and right is left.

With the plane low to the ground, all of your stick movements should be done slowly. That way, if the plane does start to head in the wrong direction, it will travel just a short distance before you apply corrective measures. Smooth slow-stick movements will prevent potential disasters more often than they will cause them. Another trick is to angle your body in the direction the plane is flying and look over your shoulder, so the sticks won't have the opposite orientation. The bottom line is that "backward thinking" will eventually become second nature. Use any crutch that helps until you have gained experience.

**Crosswind landings.** Crosswind landings are among the most difficult situations. If you have practiced all of the basic steps to landing, such as mastering a standardized landing pattern and using elevator to control speed, throttle to control altitude, ailerons to keep the wings level and rudder to steer the plane at slow speeds, you won't find crosswind landings so difficult. Regardless of the wind conditions, the key to any landing is a good approach. If you aren't happy with your landing approach, call it off and come around again. Consistently following a rectangle pattern every time you land your plane will improve your odds of a good approach. To maintain better control, it is good practice to keep your approach speed a little above what you would normally use, especially in gusty winds.

When landing in a crosswind, the plane has a tracking path (the direction in which the plane is traveling). If you use a technique called "crabbing," the plane also has a heading direction (the direction in which the plane's nose is pointed). The strength and direction of the crosswind will determine how much crab angle you will need to keep the plane on a straight track down the center of the runway.

For example, a 15mph wind coming across the runway at a 10-degree angle will make little difference on your landing approach; however, a 15mph wind coming across the runway at 45 degrees will require some compensation on your part during landing. A 15mph wind coming across the runway at 90 degrees will require total concentration on landing.

Establish a natural crab angle so that the plane tracks parallel down the runway with the fuselage slightly angled into the wind (the angle will be dictated by the crosswind). Use the rudder to turn the nose into the wind and the ailerons to keep the wings level. If you have too much or too little crab angle, the plane will start to track off course, so adjust your rudder accordingly to get the plane to track straight down the runway. Once the fuselage is about a foot or two above the runway, slowly apply opposite rudder so that the plane straightens out parallel to the runway, and flare the plane as you normally would. Remember to move all of your controls (including the rudder) slowly. Moving the rudder quickly at this slow speed could cause a spin, and that's the last thing you want.

After a bit of practice, you'll never fear crosswind landings again.

## COMPUTER ASSISTANCE

Using a computer radio will allow you to incorporate some mixing programs that can make landing your aircraft just a bit easier. If your plane is equipped with flaps, you can program a mix so that once the flaps drop down to slow the plane, the elevator automatically compensates for the extra lift by applying some downtrim. Even if your plane doesn't have flaps, you can set up a mixture to have the ailerons drop down and act as flaps while still working as ailerons. This will slow your plane down but still give you the control you need to keep the wings level.

Other mixes that could help with landing the plane include one that automatically applies a little up-elevator as the motor is throttled back. This will keep the plane flying at slower speeds. Another mix could be set so that when the rudder is applied, it gives opposite ailerons to keep the plane level. Dual rates would be helpful to have so that when the plane slows down, you can switch to high rates and have more control throw. This is equivalent to having more control authority at slower speeds.

The ultimate mixing program for landing is one that puts the plane in a landing mode. With one flip of a switch, you can have the plane lower the landing gear (if equipped with retractable); lower the flaps; incorporate a rudder/aileron mix to keep the turns flat; automatically adjust the elevator to compensate for the extra lift generated by the flaps; and switch all of the control servos to high rates. Now your plane is set up for a soft, gentle touchdown.

## TOUCHDOWN

By following these pointers, you can greatly increase your odds of a perfect landing—not just occasionally but consistently. It's important to become as proficient at bringing your skills as you are with your loops and rolls. Perfecting your expertise at bringing your plane in safely is the most cost-effective talent you'll develop! Before you know it, you'll be landing like a pro.