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Short Field Landings

Practice and you can touch down and get the DC-3 / R4D stopped in about 1,500 feet or less.

Here are the steps that will let you achieve those results.

1. Fly the approach with full flaps and use 70 to 75 knots as the target airspeed.
2. Use a slightly flatter than normal approach.
3. Retract flaps to a 3/4 Flap setting as you enter the ground effect, and
4. Power to idle and touchdown in the first 100 feet of the runway.
5. Begin gentle braking immediately, and
6. Fully retract the flaps.
7. Bring the yoke back to force the tail down to a three point attitude, and
8. Crank the seat Up, so the runway ahead is visible.
9. Begin heavy braking until the bird is stopped.

Now to accomplish those nine steps

1. At 70 knots, you need to pay attention to airspeed throughout the approach. If speed bleeds off, it doesn't take much to get down to stalling airspeed. Establish full flaps and final approach speed early. You need to be set up at least three miles out on final.

NOTE: Make the gear and flap transition easier. I use Button 2 on my joystick to control the gear (Up and Down). I have Button 3 set to retract flaps by one notch (Button 4 extends flaps by one notch). This way, I can control flap settings without looking down to the keyboard for the key commands (F6 and F7). This flap control is vital for Step 3.

2. Don't make the approach too flat. A normal approach calls for around 500 feet per minute (fpm) rate of descent to maintain a glide slope. Here, we'll want about 300 fpm for the last 300 to 400 feet of altitude.

Steps 3 and 4 happen almost simultaneously

3. Ground Effect - that's the last 20 to 50 feet of air above the runway. As you enter the ground effect, there is additional lift from the air bouncing off the ground and being deflected back up at the plane. To counter that added lift, retract the flaps to the 3/4 setting.

4. Pull the throttles to idle and touchdown main gear first. More about checking your touchdown point later.

Steps 5 and 6 happen simultaneously.

5. If you begin hard braking at this point, you could dig in and plow a furrow with the nose. Button 1 on my joystick allows me to apply braking. Again, I don't need to look down at the keyboard for the period (.) key.

6. Fully retract the flaps. For me, that's three clicks of Button 3 on the joystick. Saves a lot time, no flailing around finding keys. Retract the flaps to kill the lift they provide and to keep the plane from ballooning back into the air.

Steps 7 and 8 happen simultaneously.

7. Pull the joystick back to force the tail down onto the runway. Make it a smooth movement. You don't want to jerk the bird back into the air.

8. As the tail goes down, the nose comes up. For landing, I have the seat set two notches up from the default. SHIFT + Enter raises the seat, one notch at a time. I'm already two notches up, but I need to raise the seat three more notches to see the runway over the nose after landing. So, I hit the SHIFT + Enter key combination three times. Actually, you can hold the SHIFT key down and tap the Enter key three times to get the same result.

9. Begin heavy braking. For me, that means pressing joystick Button 1 fully down and holding it till I roll to a stop. Keep the stick fully aft to maintain a three-point attitude on the runway.

Put it into practice

Save a Flight - Set up a flight in Flight Simulator and save it (Flights | Save Flight). I have one called Short Field that I saved after I flew the DC-3 to a five-mile final, at pattern altitude (1,000 feet Above Ground Level (AGL)) at a runway with a VASI (Visual Approach Slope Indicator). Fly the approach to a landing, check the touchdown point, and fly it again (Flights | Reset Flight in the menu system).

Concentrate on your view of the runway in relation to the windscreen. Use the VASI sparingly. In real life, and in Flight Simulator, runways where you'll need short field landing skills generally will not have a VASI.

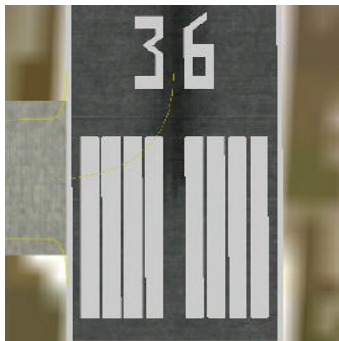
When you've practiced enough with this setup, graduate to a saved flight at a runway without a VASI. Check the runway width where you're practicing -- probably 150 to 200 feet wide.

Runway width will change your perception of the approach. Most airports that require short field techniques will be much narrower -- perhaps as narrow as 75 feet. **A narrow runway will appear to be farther away than it actually is (when mentally compared to a 150 foot runway).**

Viewing the touchdown point

When you feel you're doing a good job of nailing the short field landing, check your actual touchdown point. As soon as you hear that "chirp" (main gear wheels kissing Mother Earth), hit the Pause key (P). Take a look outside using SHIFT + S (that's fastest was to the best view).

Now you're in Spot View. Use SHIFT + [arrow key] (or the Hat Switch on the Joystick) to move around the plane. In FS2000 that allows you to "scroll" around the plane. FS2002 only gives four views. In FS2002, CTRL + [arrow] key gives a more top down view. Experiment to see which one lets you see the plane and the runway. How close to the end of the runway are you? You should touch down on those white stripes on the end of the runway. See the picture below.



If the runway doesn't have those stripes, shoot for a point that is about 1 1/2 fuselage lengths from the end of the runway. The DC-3 is about 65 feet long, so 1 1/2 fuselage lengths should be about 100 feet.

Satisfied with the touchdown point? Good. Switch back to a Cockpit View by pressing the "S" key. Hit the Pause (P) key again and complete the landing sequence. When the plane comes to a complete stop, set the Parking Brakes (CTRL + . (period key)).

Now look at the stopping distance using the Top Down View (CTRL + S). The plus (+) and minus (-) keys will zoom in and out. Adjust the view so that you can see the entire runway. You should know the length of the runway. Eyeball the distance it took you to roll to a stop and compare it with total length. For example: The runway is 8,000 feet long. Using your fingers, a ruler or a pencil, measure the landing roll (LR). Now see how many times that same LR length fits into the rest of the runway. Let's say you can fit four

more LR lengths into the rest of the runway. That's a total of five; divide length by 5 (8,000 divided by 5) equals 1,600 feet for the landing roll.

Here is Meigs Field, which is 3,899 feet in length.



Land Runway 36 and assume the "X" is the roll out and stop position. I measure the distance from the touchdown end of the runway and then find I can fit that distance into the remaining runway, three more times. Three plus one is four, so 3,899 divided by 4 equals 975. I was able to land and stop in about 1,000 feet.

When you can touchdown short and stop short on a consistent basis, you're a short field lander. Congratulations. Now try it at a real 2,000-foot runway.

I prefer to use the full Cockpit view. For those of you using FS2002 there is another view that may be helpful picking out your touchdown point. The "W" key puts you in Full View with six instruments, including airspeed, available for you.

FS2000 Full View doesn't provide the instruments and I'd caution against flying so close to stall speed with no airspeed instrument. Of course, you can set up the sim parameters using SHIFT + Z three times. That gives you several parameters including Airspeed (digital readout at top of screen).

More on holding the glide slope visually and with a VASI. Check the DC-3 Airways web site for more, using this link:
<http://www.dc3airways.com/entry.html>

There are additional visual cues you can use on the following page. Practice, practice, practice. It's the only way to become proficient.

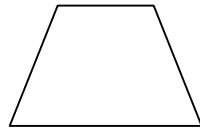
Just don't run out of airspeed, altitude and ideas at the same time ☺

Best wishes,

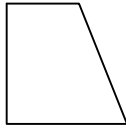
John Achor, DC3-324 __x_(" ")_x__

Visual Cues For Line Up On Center Line and Glide Slope

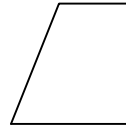
Lining up on the runway centerline. These are the views you will see based on center line (exaggerated).



On Center
Line

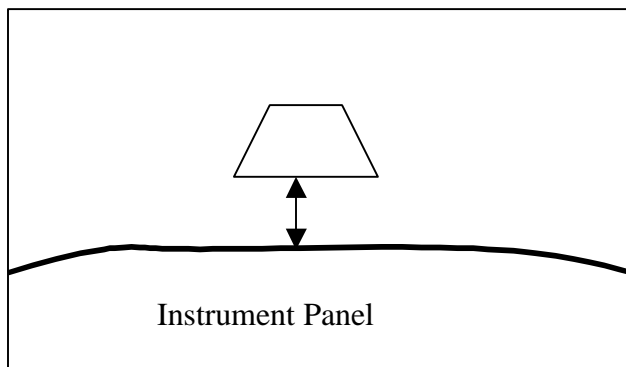


Left Of
Center Line



Right Of
Center Line

Judging position on the glide slope based on the view of the runway.

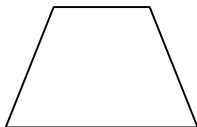


↑↓ This is the distance of the runway “picture” above the top of the instrument shroud that keeps you on the glide slope.

If the runway “moves” **down**, toward the shroud, you are going **high** on the glide slope.

If the runway “moves” **up**, away from the shroud, you are going **low** on the glide slope.

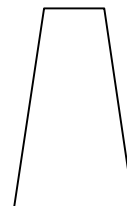
Here is another visual tip-off of your position relative to the glide slope (exaggerated again).



On Glide
Slope



Low on
Glide Slope



High on
Glide Slope

Screen Shots (FS 2002)

500 feet AGL, gear and full flaps, descending at 600 fpm



250 feet AGL, descending at 300 fpm



Over the fence, 75 feet AGL, descending at 250 fpm



Touchdown, gear, 3/4 Flaps (Spot View, external view)



That swirl of smoke to the right of the tail is off the main tires.

In the one below, I couldn't get the full runway. This the Top Down View (CTRL + S) to judge the amount of runway used. I'm at a full stop about 1,500 feet from the approach end of Runway 09R.

