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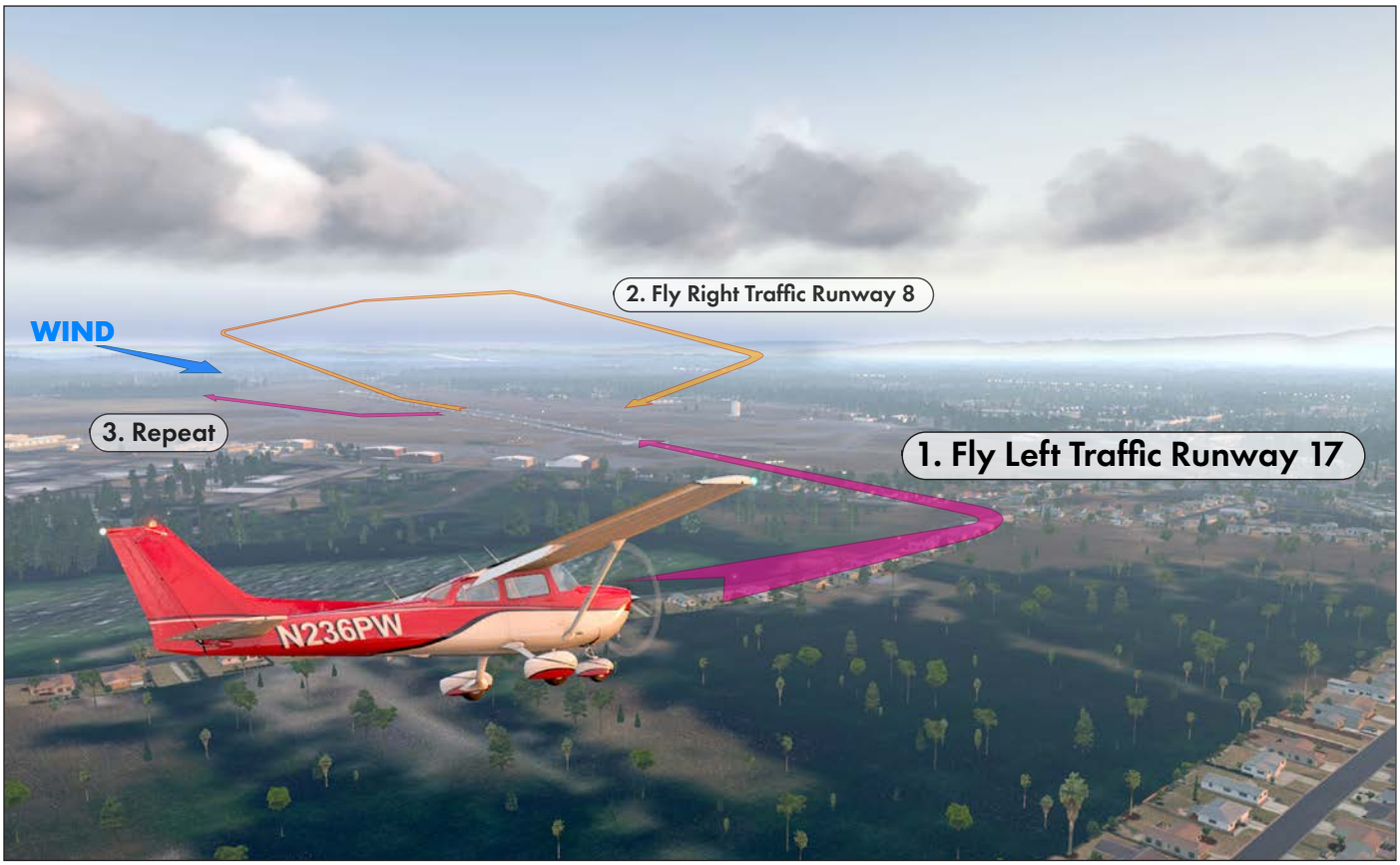
This is excerpted from the

Pilot Exercise Program

A Pilot-Friendly® Manual



Fifteen skill-building challenges to improve your flying!

No-Panel Landing

Sure, your head is mostly outside in the traffic pattern, but how well can you land with no flight instruments at all?

Difficulty

Crew

From the first days of flight training, we're taught to watch our airspeed like a hawk on final. It's a worthy point: airspeed is a proxy for AOA on most light airplanes and exceeding critical AOA close to the ground (but above the landing flare) too easily leads to a fatal stall.

Having an AOA indicator is an improvement, but these instruments can have common failure points, so you still might find yourself landing with no airspeed indication some day. In fact, you might have to land with no instruments at all.

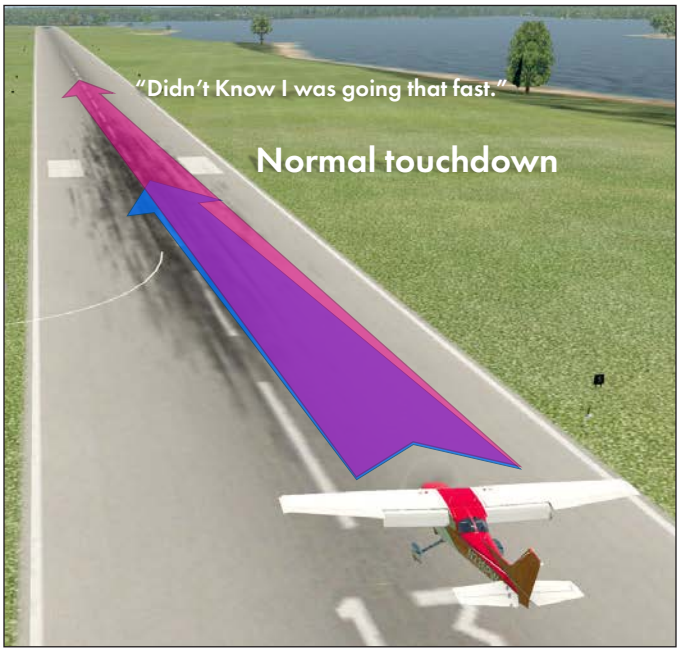
Start with Everything Except Airspeed

Step one is finding a runway that's long enough for a floating landing or a stop-and-go. You'll want one that's at least twice as long as you require for a safe, full-stop landing.

Practice a few normal landings to a complete stop on the runway. These could be stop-and-goes or full-stops with a taxi back to take off. Do whatever works best for traffic and available runway. Use a consistent aiming point, because these test landings provide a baseline for where the wheels touch down and where you come to a complete stop. Do this at least three times so you have a good average.

Pay close attention to the sound of your engine on downwind, and again when you reduce power for landing. Extend flaps and landing gear (as applica-

You'll likely float the first few times, so choose a runway with more length than you'd need normally.



SAFETY NET

- Find an instructor experienced in this maneuver and comfortable performing it.
- Go around for any stall warning or indication on final approach.
- Don't actually disable or power down instruments, and leave all system instruments and warning lights (oil temp, voltage, etc.) visible.
- Set a minimum remaining runway for a stop-and-go. Stopping beyond that requires taxiing back for a fresh takeoff.

SCORECARD

You can do this, but can you do it with style? To score high, the attempt should seem effortless.

Pitch control on final to flare:
1: Steady pitch attitude
0: Multiple pitch changes
(*Any stall warning without go-around is 0 for the entire exercise.*)

Enter flare at same point as done on test landings:
1: Same position on runway
0: Earlier, or >200' further

Distance from flare to touchdown (floating) compared to tests:
1: 0-100' longer, or shorter
0: >100' longer

Energy at touchdown:
1: Normal landing attitude
0: Flat attitude (or worse)

Position when fully stopped compared to tests:
1: 0-300' longer, or shorter
0: >300' longer

Total Score for No Panel Landing:

ble) at consistent points in your pattern, and note the change in elevator trim necessary to maintain the desired airspeed on downwind, base, and final approach.

If you're doing this at a towered airport, ask for "the option." This landing clearance takes the place of "cleared to land" or "cleared touch-and-go." "Cleared for the option" allows you to do any low-approach, touch-and-go, stop-and-go, or full-stop landing without telling the tower which you plan. You'll only get the option when traffic permits, but it's the perfect clearance for practice landings at a towered airport. For non-towered operations, make sure there's enough room in the pattern behind you and announce that you'll be a "stop-and-go, with a moment sitting on the runway."

Once you have your landing technique dialed in, fly another pattern, but this time have your instructor cover the airspeed indicator (or tape) on the downwind. If your airplane has an AOA indicator, cover that too. You're simulating loss of data from the pitot mast, so you won't have airspeed or AOA indications for the rest of the landing.

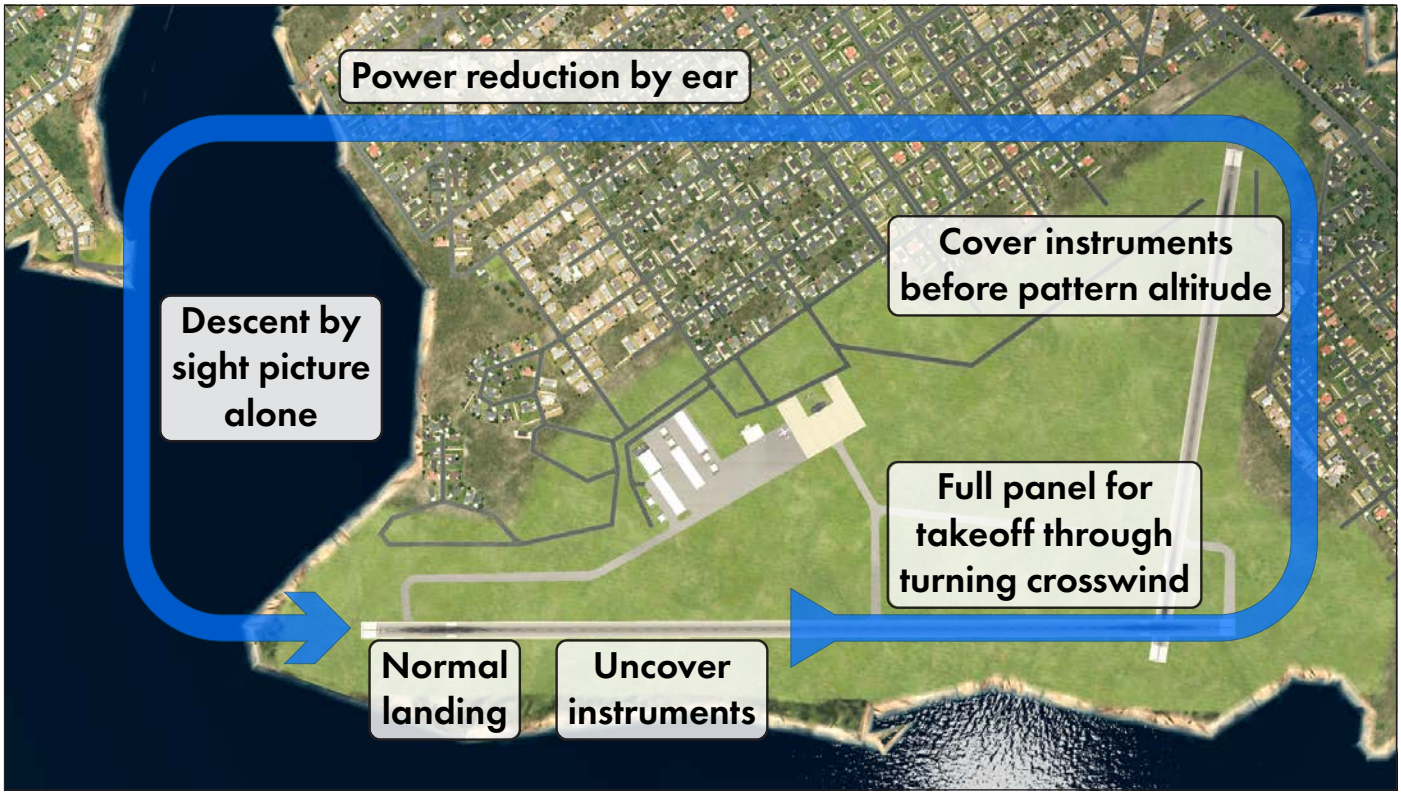
Your best method is setting the same power you used in the three previous patterns, extending gear and flaps at the same places, and flying the same visual glidepath. You just landed three times, so you should have a good sense of the winds.

Because you can't see the airspeed getting low, any hint of a stall—buffet, stall horn, or even an oddly nose high attitude—requires an immediate go around. There's no scoring penalty for a go around, even from the flare. You'll just fly another pattern and do it again. If you go around, the instructor should remove the instrument covers, allowing you to see all flight instruments. Any systems warning, such as low voltage is another reason to uncover the instruments.

The common error isn't approaching too slowly, however. Pilots tend to land too fast without airspeed indication. As you transition to the flare, you may realize you have more energy than planned. Just as with any landing that's flyable but a bit too hot, bleed off the speed and accept the floating as long as you have sufficient runway remaining. Don't force the plane down on the runway.

PUMP IT UP: TAKE NO-PANEL ON THE ROAD

After you've practiced this no-instrument landing technique, take it on the road. In cruise flight, have your instructor cover the flight instruments, tachometer and manifold pressure gauge (if equipped). Based on your runway requirements, select an airport and descend for a landing with no flight instruments at all. Have your instructor use an iPad or other GPS-enabled device as a reality check on pattern altitude and airspeed for flap or gear deployment.



The standard rule is to have wheels on pavement in the first third of the runway. The location of your abort point is your choice. Just make sure you leave sufficient room for a complete stop.

When it's time to take off for another try, have the instructor reveal the airspeed indicator.

Cover Just About Everything

After a few circuits without a known airspeed, fly another, but this time on the crosswind have the instructor cover all flight instruments plus the tachometer and manifold pressure gauges. This might take a few stickies or dimming of displays. Just be sure the instructor is ready to uncover them quickly—airspeed first—in the event of a go around.

You'll level off at pattern altitude by sight picture, but you've done it several times by this point. However, being just 100 feet off can mess with your landing energy. Do your best to put your wheels on your target touchdown point, and come to a stop at or before the one you established in the test runs. Score the landing.

Always launch with everything working, but cover the instruments before reaching pattern altitude.

SEE IT IN THE SIM

Location: Wausau Downtown, Wausau, WI. Left traffic for Runway 13.

Conditions: Clear skies, winds unknown to keep it interesting.

This Could Really Happen to You

Most light airplanes are one well-placed bug strike away from losing airspeed indication. Losing all indications may seem unrealistic, but there are VFR airplanes with only one display, including many LSAs. Losing the display means you have no flight or engine instruments.

Even if your airplane is immune to this total failure, standard power profiles and established checkpoints in the pattern improve the consistency of your landings. Consistency lets you fine tune any landing for better results overall.

Flying entire patterns with nothing but sound and sight picture is just fun as well. You'll end up with better landings, even with all instruments working.