

Achievements: Your Landing Data

CAVacars 2 measures your touchdown in detail, and the landing achievements are based on those numbers. This article explains what's measured, how, and how to earn each landing achievement.

You'll find these numbers for every flight on the PIREP details page on the website, under **Touchdown**.

What CAVacars 2 measures

At touchdown, CAVacars 2 reads your sim many times a second rather than once a second, so short events like a bounce or a G spike aren't missed.

Value	How it's measured
Rate (fpm)	Your vertical speed, averaged over the last quarter of a second before the wheels touch. A descent is negative: –120 fpm is a gentle landing.
G-force	The highest load factor in the first second after touchdown. A firm landing that settles quickly still shows its peak.
Pitch	Nose up or down at touchdown, in degrees. Positive is nose up.
Bank	How far your wings are from level at touchdown, in degrees.
Crab	The angle between where the nose points and where the aircraft is actually going over the ground. A crab of 0° means you lined the nose up with the runway.
Bounces	A bounce is when you're back in the air for at least a quarter of a second and touch down again within 10 seconds.
Wind	The wind at your aircraft at touchdown, from the sim.
Weather	Whether it was raining or snowing, and the visibility, at touchdown.

Touch-and-goes: only your **last** landing of the flight counts. If you do a touch-and-go or a go-around, the final landing at your destination is the one that's judged.

How crosswind is calculated

The crosswind is worked out from the wind and the direction you were travelling down the runway:

1. **Your direction down the runway** is your heading minus your crab angle. That's your actual path over the ground at touchdown.
2. **The wind angle** is the difference between where the wind is coming from and that direction.
3. **Crosswind** = wind speed $\times$ $\sin(\text{wind angle})$. **Headwind** = wind speed $\times$ $\cos(\text{wind angle})$. A negative headwind is a tailwind.

For example, a 20 kt wind 40° off the runway gives a crosswind of $20 \times \sin(40^\circ) \approx 13$ kt and a headwind of about 15 kt.

These are calculated on our server from the raw numbers CAVacars 2 records, so they're the same for every pilot and every sim.

A clean landing

Several achievements ask for a **clean landing**. That means:

- no crash
- no bounce
- a rate between 0 and -300 fpm
- 1.5 G or less

The landing achievements

Butter

Touch down between **0 and -60 fpm**, at **1.15 G or less**, with less than **2° of bank** and no bounce.

Tip: Butter is about a gentle flare. Don't float down the runway hunting for a perfect 0 fpm, though: the wings need to be level too, and a long float in a gusty wind often ends in a wing dip.

Textbook

Everything at once: **-60 to -180 fpm, 1.25 G or less, 0 to 8° of pitch** (nose up, not flat or nose down), less than **2° of bank** and less than **2° of crab**, and no bounce.

Tip: Textbook isn't the softest landing, it's the right one. Fly a stable approach, flare normally, and land firmly on the main gear with the nose aligned with the runway. In a crosswind, de-crab before touchdown.

Consistency

Land in the **-60 to -250 fpm** band at **1.4 G or less**, flight after flight. Any landing outside the band, including one that's too soft, starts the count again. Bronze is 10 in a row, Silver 25 and Gold 50.

Tip: This rewards a normal, positive landing every time. Don't chase greasers, they can take you outside the band.

Greaser Streak

String together landings between **0 and -150 fpm** at **1.3 G or less**. A firmer one ends the streak. Bronze is 5 in a row, Silver 10 and Gold 25.

Crosswind Ace

A clean landing in a strong crosswind, with less than **5° of bank** and less than **5° of crab** at touchdown. Your strongest such crosswind counts: 15 kt for Bronze, 25 kt for Silver and 35 kt for Gold.

Tip: Live weather is your friend here. Look for gusty days at airports with a single runway. Crab on the approach, then use rudder to line the nose up and a little aileron into the wind to stay on the centreline.

De-crab Master

A clean landing in at least **15 kt of crosswind** with less than **1.5° of crab**. This is about lining the nose up with the runway just before the wheels touch.

Tip: Hold the crab until the flare, then smoothly apply rudder to straighten the nose. Too early and you'll drift off the centreline, too late and you'll touch down sideways.

Other achievements that use landing data

- **Diversion Done Right:** a clean landing at an airport other than your planned arrival (more than 5 nm away from it).
- **Weather Warrior:** a landing in rain or snow, or with visibility under 3 statute miles. Turn on live weather or set it up yourself.

If something looks wrong

If a value on your PIREP looks impossible, our server ignores that flight's data for achievements. You'll see a note about it on the PIREP details page. It's usually caused by a sim glitch. If it keeps happening, let us know in Discord with the PIREP link.

Revision #1

Created 10 October 2026 23:23:38 by Jan P.

Updated 10 October 2026 23:23:38 by Jan P.