

Aviation — The Terms You Actually Need

Ranked glossary · 33 core terms, then 10 more · the 80/20 of Anderson's *Introduction to Flight*, the FAA *Pilot's Handbook*, and Shaw's *Fighter Combat*

Learn six first: angle of attack, relative wind, lift, drag, load factor, stall.

Almost everything below is built from those six. Terms are ranked, not alphabetical — a term is core if other definitions depend on it, and secondary if it is a refinement or a specialist case.

The core 33

- **Relative wind** — the direction the air is moving past the aircraft. Always measured against the aircraft, never against the ground.
- **Chord line** — a straight line from the leading edge of the wing to the trailing edge. The reference every wing angle is measured from.
- **Angle of attack (AoA)** — the angle between the chord line and the relative wind. The single most important number in flight, and it is not the same as pitch attitude.
- **Lift** — the force component perpendicular to the relative wind. Comes from the pressure difference between the wing's upper and lower surfaces.
- **Drag** — the force component parallel to the relative wind. The bill you pay for lift and for moving through air at all.
- **Stall** — what happens past the critical angle of attack: airflow separates from the wing and lift drops sharply. An angle event, never a speed event.
- **Airfoil** — the cross-section shape of a wing. Its geometry determines how much lift it makes at a given angle and how much drag comes with it.
- **Camber** — the curvature of the wing, measured as the maximum gap between the mean camber line and the chord line.
- **Mean camber line** — the line running halfway between the upper and lower surfaces. Its shape is what makes one airfoil differ from another.
- **Span** — wingtip to wingtip. **Chord** — leading edge to trailing edge. Together they set the wing's area.
- **Aspect ratio** — span squared divided by wing area. High aspect ratio means long thin wings: cheaper lift, which is why gliders look like they do.
- **Parasite drag** — drag from pushing shape and skin through the air. Grows with speed, so it dominates when you are going fast.
- **Induced drag** — the drag created as a by-product of making lift. Falls as speed rises, so it dominates when you are slow.
- **Drag polar** — the curve relating drag coefficient to lift coefficient. It describes an aircraft's whole aerodynamic character in one line.
- **Lift-to-drag ratio (L/D)** — how many units of weight you carry per unit of thrust spent. At L/D 15 you lift fifteen pounds for one pound of drag.

- **Load factor** — the ratio of lift to weight, expressed in G. Straight and level is 1 G; a 60° banked turn is about 2 G.
- **Stall speed** — the speed at which the wing reaches critical angle of attack *at that load factor*. It rises as the square root of load factor.
- **Any aircraft can stall at any airspeed**. Pull hard enough and you reach critical angle of attack at any speed. This is the sentence worth memorising.
- **Manoeuvring speed (V_a)** — the fastest speed at which full control deflection will stall the wing before it breaks the airframe.
- **Indicated airspeed (IAS)** — what the instrument reads. **True airspeed (TAS)** — actual speed through the air, which exceeds IAS as you climb.
- **Pressure altitude** — altitude with the altimeter set to the standard 29.92 inHg. The input to most performance charts.
- **Density altitude** — pressure altitude corrected for temperature. The number that actually predicts whether you will get off the runway.
- **Standard atmosphere** — an agreed fictional atmosphere used so performance figures can be compared. Real air is never exactly it.
- **Pitch, roll, yaw** — rotation about the lateral, longitudinal and vertical axes. Controlled by elevator, ailerons and rudder respectively.
- **Centre of gravity (CG)** — the point the aircraft balances about. Its position relative to the neutral point decides whether the aircraft is stable.
- **Trim** — setting the controls so the aircraft holds an attitude without sustained pressure from the pilot.
- **Coordinated turn** — bank and rudder matched so the aircraft turns without slipping or skidding. A **skid** means too much rate for the bank.
- **Turn rate** — degrees per second. **Turn radius** — how tight the circle is. They are different goods and you usually trade one for the other.
- **Energy versus angles** — spending speed to gain position now (angles) or keeping speed to win over several passes (energy). The central trade in air combat.
- **Aeronautical decision making (ADM)** — a taught, systematic process for choosing the best course of action. Roughly 75% of accidents involve human factors.
- **Poor judgment chain** — one bad decision makes the next more likely, and each one removes options. Interventions target the chain, not the first error.
- **Situational awareness** — an accurate running picture of the aircraft, the environment and yourself. Fatigue and fixation are its main enemies.
- **Density altitude kills on takeoff** — high, hot and heavy compound rather than add. Certification to a weight is not permission to fly at it everywhere.

The other 10 — refinements and specialist cases

Worth knowing, but none of the core definitions depend on them. Come back to these once the 33 above are solid.

- **Planform** — the shape of the wing seen from above. Rectangular, tapered, swept or delta, each with different stall and drag behaviour.
- **Centre of pressure** — the point where all the wing's aerodynamic force can be treated as acting. It moves with angle of attack.
- **Aerodynamic centre** — the point about which the pitching moment does not change with angle of attack. Near the quarter-chord on most subsonic wings.
- **Best glide speed** — the speed where L/D is at its maximum. Also the speed for minimum thrust required in level flight.
- **Spin** — an aggravated stall where one wing is more stalled than the other, producing autorotation. Recovery costs altitude and requires specific inputs.
- **Mach number** — speed divided by the local speed of sound. Above the critical Mach number, shock waves add wave drag that has no low-speed equivalent.
- **Neutral point** — the CG position at which the aircraft is neutrally stable. For stability, the CG must stay forward of it.
- **Static margin** — the distance between CG and neutral point. More margin means more stability and more trim drag; less means more manoeuvrability.
- **Corner speed** — the speed giving the best combination of turn rate and radius, where maximum G and minimum radius meet.
- **Wing loading** — weight divided by wing area. Low wing loading turns tighter at low speed; high wing loading suits high-speed flight.