

Glossary

This represents just a small list of aeronautical terms. These terms are applicable to power aircraft, particularly rotorcraft and fixed wing, not necessarily to both. If one is to seek proficiency in any form of flying, one should look at all the parameters of that particular aircraft.

Key: (A) Airplane (H) Helicopter (G) Gyroplane

Above the Ground Level (A) (H) (G)

The distances from the aircraft to the ground.

Advancing Blade (H) (G)

The advancing blade is that portion of the rotor disc in which the rotation of the blade is moving in the direction of the aircrafts travel.

Aerodynamics (A) (H) (G)

Aerodynamics represents a law of Physics that deals with the motion of air and other gases and with the effects of such on aircraft.

Airfoil (A) (H) (G)

An airfoil is a surface designed to produce lift from the movement of air over it. Ideally, it should present the greatest amount of lift with the least amount of drag.

Antitorque System Failure (H)

Results in loss of the ability to maintain directional control at lower air speeds

Articulated Rotor (H) (G)

This system is one in which the rotor blades are free to flap, drag (hunt), and feather.

Autogiro (G)

Autogiro, autogyro, gyroplane and gyrocopter are terms that are interchangeable. The FAR's classify this aircraft as a rotorcraft gyroplane. It derives its lift from a freewheeling rotor system; the rotation is generated by relative wind flowing up through the rotors.

Autorotation (H) (G)

This is a normal configuration for gyroplanes. On the other hand, helicopters, in an emergency procedure must transition into autorotation when the engine quits.

Best Glide (A) (H) (G)

Best glide is practiced as a way to extend an approach to a more desirable landing site.

Blade Loading (H) (G)

This is calculated for uses in designing rotorcraft for a particular application. The formula is as follows; use the combined area of all the blades (not the disc area) and divide this by the gross weight of the aircraft to determine the blade loading.

Center of Gravity (A) (H) (G)

Center of gravity (CG) – An imaginary point where the resultant of all weight forces in the body may be considered to be concentrated for any position of the body. The main purpose is maintaining positive flight controls over the course of the flight resulting in a safe flight from take off to landing.

Collective Pitch Control (H) (G)

Collective pitch control is the method of control by which the pitch of all rotor blades is varied equally and simultaneously.

Cruise Speed (A) (H) (G)

Cruise speed is the optimum speed that an aircraft can fly.

Cyclic Pitch Control (H) (G)

This allows for individual pitch of the rotor blades during a cycle revolution that controls the tilt of the rotor disc, and therefore, the direction and velocity of horizontal flight.

Flare (A) (H) (G)

This is a landing maneuver performed near the ground to slow the aircraft rate of descent and forward air speed.

Gross Weight (A) (H) (G)

Maximum weight of aircraft is established in the type certificate. This includes pilot, passengers, baggage, oil, and fuel and is adjusted accordingly.

Ground Effect (A) (H) (G)

This is the cushion of air that is beneath the aircraft. A general rule is about half the width of the airfoil.

Ground Resonance (H) (G)

If ground resonance occurs, it will occur only in aircraft with three-bladed, fully articulated rotor systems and landing wheels. It usually occurs during a “bad” landing such as touching down on one wheel. This sends a shockwave to the rotor system, in turn causing the blades which are normally 120 degrees apart, to move closer together resulting in an out of balance system. More often than not total destruction will occur. Note: Most manufacturers of this type of rotor system have implemented a change that has been very effective in preventing this.

Maximum Range (A) (H) (G)

Maximum range varies and is influenced by payload and atmospheric conditions.

Maximum Service Ceiling (A) (H) (G)

The maximum altitude to which an aircraft can climb. This varies from aircraft to aircraft and is influenced by payload and atmospheric conditions.

Maximum Speed (A) (H) (G)

This is the highest speed the aircraft can attain in level flight. The maximum speed is limited by design, payload and atmospheric conditions.

Minimum Speed (A) (H) (G)

The slowest the aircraft can fly and still be able to maintain altitude and directional control. This speed varies with design, payload and atmospheric conditions.

Nap of the Earth (A) (H) (G)

Flying at or below treetop or obstruction level while following the contour of the terrain.

Noise Level Dba (A) (H) (G)

Sound measured by its pressure or energy in terms of decibels. The decibels scale is logarithmic: when the scale goes up by ten, the perceived sound is two-times as loud.

Parasite Drag (A) (H) (G)

Parasite drag is anything that is not considered in the design to achieve lift.

Pilot Induced Oscillation (G)

Pilot induced oscillation is a phenomenon usually associated with recreational gyroplanes caused by delays in the pilot's reaction time to flight controls and shift in body weight.

Power Loading (A) (H) (G)

This is the gross weight of the aircraft divided by the horsepower of the engine.

Retreating Blade Stall (H)

This occurs during high forward airspeeds. This blade is on the opposite side of the advancing blade and is moving slower with a high angle of attack. The separation of the airflow from the surface of the airfoil results in a stall.

Rigid Rotor (H) (G)

A rotor system with blades fixed to the hub in such a way that they can feather but cannot flap or drag.

Semirigid Rotor (H) (G)

Semirigid rotor is a system in which the blades are fixed to the hub but are not free to flap or feather.

Service Ceiling (A) (H) (G)

This is the altitude at which an aircraft still maintains the potential to climb at 100 feet per minute. This is influenced by design, payload and atmospheric conditions.

Settling with Power (H)

The conditions that prevail to set this up, is forward airspeed of less than 10 miles per hour, a descent rate of at least 300 feet per minute and using from 20 to 100% power. When the pilot increases the pitch with collective the aircraft gets caught up in its own rotor wash. The more collective applied, the faster the descent.

Short Take Off and Landing {STOL} (A) (G)

This is based on zero wind and standard temperature. It refers to an aircraft that requires less runway than other aircraft of comparable size and weight. (Usually 20 to 100 feet)

Slip (A) (H) (G)

A slip is the controlled flight of an aircraft in a direction not in line with its fore and aft axis.

Stall (A)

The separation of the airflow from the surface of the airfoil will result in loss of lift.

Time Life Components (A) (H) (G)

Components have a life that has been established by the manufacture either to be replaced or overhauled.

Transition From Power Flight To Autorotation (H)

Height-velocity curve is the major consideration for this emergency procedure to be successful. It requires that allowance be made for design, altitude, airspeed, payload, atmospheric conditions and pilot skills. Using the above information the transmission has to be released and rotor pitch has to be adjusted to allow the airflow to pass up through the rotor system.

Transitional Lift (H)

The additional lift obtained through forward flight, which creates increased efficiency in the rotor system, or hovering in a wind of 15 to 20 miles per hours.

Vertical Take Off and Landing {VTOL} (H) (G)

No runway required. This is based on zero wind and standard temperature, design, payload and atmospheric conditions.