

Glossary (A-F)

A B C D E F

360, 540, etc.

Number describing degrees in an arc. A 360 represents one full turn through an axis. A 360 turn, for example, is a flat turn where the aircraft does not roll its wings but rather just 'slides' through 360 degrees turning on rudder only.

For helis: A 540 stall turn, for example, describes a one and one half revolution spin at the apex of a vertical stall, which results in the helicopter resuming nose forward flight before recovery.

3D

Term is describing a type of flight pattern, which is characterized by the performance of very specialized aerobatic maneuvers below the model's normal stall speed. Examples include torque rolls, 'walk in the park', harriers, hangers, etc.

for helis: combining two or more maneuvers into one maneuver. Examples: rolling circle, inverted backwards loop.

3F

Slang abbreviation for flip flop flying. Similar to 3D, but without the finesse.

A

ATL = Adjustable Throttle Limiter

High-end feature which adjusts to bring full servo potential within the limits of bind-free servo travel. Ideal for throttle control, or for more effective braking in gas racing.

ATV/EPA = Adjustable Travel Volume/End Point Adjustment.

Allows separate adjustments of maximum servo travel to both sides of neutral. Helps tailor outputs for different control styles.

Activating (Arming) Switch

An external switch that prevents the electric motor from accidentally turning on.

Adjustable Function Rate (AFR)

Similar to ATV, AFR allows end point adjustment independent of Dual Rate or Exponential settings.

Adjustable Travel Volume (ATV)

End Point Adjustment, ATV you can independently preset the maximum travel of a servo on either side of neutral.

Adverse Yaw

some airplanes, especially high-wing airplanes with flat-bottom airfoils, have a tendency to yaw in the opposite direction of the bank. This is most common when flying at low speeds with high angles. Adjusting the ailerons can help reduce the yaw.

Aerodynamics

Science of air in motion.

Aft

Towards the rear. Used such as: "...with an aft center of gravity...."

Aileron Differential

Creating larger upward aileron travel than downward aileron travel to help minimize the model "dragging" the drooped aileron which causes a model to yaw with aileron input.

Aileron Extension

The Aileron Extension (also known as a servo extension) is a cable with connectors on either end which goes between the receiver and a servo. This allows the servo to be placed at a greater distance from the receiver than the cable that comes on the servo will allow. It also permits easier removal of a wing when the servo that controls the aileron is mounted in the wing and the receiver is in the fuselage (which is usually the case).

Ailerons

Hinged control surfaces located on the trailing edge of the wing, one on each side, which provide control of the airplane about the roll axis. The control direction is often confusing to first time modelers. For a right roll or turn, the right hand aileron is moved upward and the left hand aileron downward, and vice versa for a left roll or turn.

Alleviators

Twin elevator servos plugged into separate channels used to control elevator with the option to also have the 2 elevator servos act as ailerons in conjunction with the primary ailerons.

Air Bleed Screw

Screw for adjusting the amount of air allowed to bleed into the carburetor during idle

Airfoil

The shape of the wing when looking at its profile. Usually a raindrop type shape.

For helis: The rotor disk is the effective wing, and airfoil refers to the shape of the blades.

AM

AM, or Amplitude Modulation, was the primary means of modulation in R/C until recently. The control information is transmitted by varying the amplitude of the signal.

AMA

The Academy Of Model Aeronautics. The official national body for model aviation in the United States. The official national body for model aviation in the United States. AMA sanctions more than a thousand model competitions throughout the country each year, and certifies official model flying records on a national and international level.

Amphibian

An aircraft that can fly off of water or land. The wheels retract into the hull or floats, depending upon the type of aircraft. An amphibian can land on water and then extend the landing gear to allow it to pull up onto the shore. Many seaplane bases had ramps to allow the airplanes to pull up onto dry land parking areas.

Angle of attack

the angle that the wing penetrates the air. As the angle of attack increases so does lift, up to a point (and drag).

Antenna

The telescoping tube that transmits the signal.

Area

The number of square inches (or feet) of the wing. It's the wingspan multiplied by the wing's chord. The area of a tapered wing is the wingspan multiplied by the average chord.

ARF

Almost Ready to Fly, a model airplane that can be put together with a minimal amount of time.

Articulated Rotor

This is borrowed from full sized helicopters, and is a rotor head which allows the blades to flap, drag and feather.

Aspect Ratio

The wingspan divided by the chord. Aspect ratio is important where a wing's efficiency is concerned. A short aspect ratio (short wings) is better for maneuvering, since it allows a high roll rate. Short wings are also stronger than long wings. Gliders use high-aspect ratio wings (long, skinny wings) because they are more efficient for soaring flight. Example: 10 ft. wingspan with a 1 ft. chord has an aspect ratio of 10.

ATS, Revolution Mixing, or Anti Torque Compensation

This is "Automatic Tail System". This refers to the radio mixing in a certain amount of tail rotor when the throttle / pitch is increased or decreased.

Autorotation

The ability of a rotary wing aircraft to land safely without engine power. This maneuver uses the stored energy in the rotor blades to produce lift at the end of decent, allowing the model to land safely.

Axis

The line around which a body rotates.

B**BEC = Battery Eliminator Circuitry**

Allows receiver to draw power from a main battery pack, eliminating the need for (and weight of) a receiver battery.

Back plate

Cover over the rear of the crankcase of an engine.

Ballast

Ballast is extra weight added to a glider to help it penetrate better in windy weather or to increase its speed. Ballast is usually added in tubes in the inner portion of the wings or in the fuselage at the center of gravity.

Ball Bearing

Servo's output shaft is supported with bearings for increased performance and accuracy.

Ball Link

Connection using a ball, and a link which rotates on the ball. Used to connect the servo to a control surface or lever.

Backlash

Term describing the amount of play between gears, or gear mesh. If too loose, the gear can slip, or strip the teeth. Too tight and excessive wear is caused.

Base Load Antenna

A rigid, short antenna mounted to the model. Used to replace the longer receiver antenna.

Battery cycling

to fully charge and discharge a battery to erase battery memory.

Battery Meter

The device used to monitor the strength of the transmitter batteries

Bell and Hiller

Control system used in helicopters. Changes pitch of blades in relation to their position via a swash plate. A fly bar with paddles is used to gain responsiveness. The two systems are linked with Control Levers.

Binding

What occurs when the friction at a joint is stronger than the linkage.

Boring holes in the sky

Having fun flying an R/C airplane, without any pre-determined flight pattern.

"Buddy" or Trainer Box

Two similar transmitters that are wired together with a "trainer cord." This is most useful when learning to fly- it's the same as having dual controls. The instructor can take control by using the "trainer switch" on his transmitter.

Butterfly

Also known as crow. A mix which activates up flaperons and down inner-most flaps for gliding speed control without spoilers or airbrakes.

C

CA

Abbreviation for cyanoacrylate. An instant type glue that is available in various viscosities (Thin, Medium, Thick, and Gel). These glues are ideal for the assembly of wood airplanes and other materials. NOTE: Most CA glues will attack foam.

CCPM

Cyclic-Collective-Pitch-Mixing. Type of swash plate mixing which requires a radio with CCPM mixing functions. This uses three servos to control the cyclic, while all three work together to raise and lower the swashplate for collective control.

CG = "Center of Gravity"

For modeling purposes, this is usually considered-the point at which the airplane balances fore to aft. This point is critical in regards to how the airplane reacts in the air. A tail-heavy plane will be very snappy but generally very unstable and susceptible to more frequent stalls. If the airplane is nose heavy, it will tend to track better and be less sensitive to control inputs, but, will generally drop its nose when the throttle is reduced to idle. This makes the plane more difficult to land since it takes more effort to hold the nose up. A nose heavy airplane will have to come in faster to land safely.

Camber

If you draw a line through the center of the airfoil that's exactly half-way between the top and bottom surface, you get the mean airfoil line. Depending upon the airfoil, it can be straight or curved. This curve is called the "camber" of the airfoil. If it has a lot of curve, the airfoil is said to be "highly-cambered".

Canard

The horizontal surface forward of the wing used to control pitch. It's found on very few aircraft. Also the word used to describe aircraft that have a main wing and a horizontal control surface in the nose...also called, "tail first" aircraft.

Capacity

The maximum amount of energy a battery can store.

Carburetor

The part of the engine which controls the speed or throttle setting and lean/rich mixture via setting of the needle valve.

Center Line

An imaginary line drawn through the center of the aircraft from the nose through the tail.

Center of Gravity (CG)

Balancing point of an aircraft.

Chandelle

A very steep climbing turn where the airplane makes a 180o change of direction.

Channel

The frequency number used by the transmitter to send signals to the receiver. If radios transmit on the same frequency, or channel, glitching will occur in the active receiver on that channel. This is due to conflicting signals sent by the two radios. Flying sites should have a frequency control system to ensure that only one radio operates on any given channel at one time. This is usually a board with some type of marker for each channel. If the marker is not available, someone else is using that channel. Do not use your radio unless you are sure you are the only one on the frequency.

Channel

The number of functions your radio can control. Ex: an 8 channel radio has 8 available servo slots used for separate control surfaces or switches. These channels can also be mixed on many radios, for such functions as collective, which increases pitch when throttle is increased.

Charge Jack

The plug receptacle of the switch harness into which the charger is plugged to charge the airborne battery. An expanded scale voltmeter (ESV) can also be plugged into it to check battery voltage between flights. It is advisable to mount the charge jack in an accessible area of the fuselage so an ESV can be used without removing the wing.

Charger

Device used to recharge batteries and usually supplied with the radio if NiCad batteries are included.

Chicken Stick

A hand-held stick used to start a model airplane engine.

Chord

The "depth" of the wing, its distance from leading edge to trailing edge. One of the components used to determine wing area. May vary from root to tip.

Clevis

The clevis connects the wire end of the pushrod to the control horn of the control surface. A small clip, the clevis has fine threads so that you can adjust the length of the pushrod.

Clunk

Located in the fuel tank, a clunk is weighted and ensures that the intake line has a steady supply of fuel.

Collective Pitch

This is the ability to vary the main blade pitch when the throttle is increased or decreased.

Computer Radio

By using the advanced programming functions of the transmitter, you can adjust the airplane without changing any mechanical structures.

Constant Drive Tail

This is a special autorotation clutch that will always drive the tail rotor even when the engine is off or in "Hold".

Control Horn

This arm connects the control surface to the clevis and pushrod.

Control Surface

Any one of the various moveable portions of the wings, tail surfaces, or canard.

Conventional Gear

The landing gear arrangement where the airplane has a main gear and a tailwheel.

Coreless motor

In a conventional servo, the motor has a steel core armature wrapped in wire that spins inside the magnets.

In a coreless design, the armature uses a thin wire mesh that forms a cup that spins around the outside of the magnet eliminating the heavy steel core. A coreless motor does not have magnets as standard servo motors do, so they have a smoother, more constant, and stronger action. Regular servo motors have either 3 or 5 magnets (poles) which when the armature is between these, the servo motor is at its weakest.

Covering

The covering of an aircraft is the skin which is applied to the airframe, closing it in. It is commonly a fabric or plastic film which is heat applied with an iron. Plastic covering, once applied, gives a durable, shiny finish and requires no further treatment. Fabric covering usually requires a layer of paint to finish it and make it resistant to the exhaust of the engine.

Cowl

The large molded fairing around an engine. It serves two purposes when done right: It helps the airflow go smoothly around the front of the airplane, and also provides a proper path for cooling air around the engine.

Crankcase

Main body of the engine

Critical Angle of Attack

The angle of attack at which smooth airflow over the top of the wing stops.

Crow Mixing

Primarily used in gliders for spoiler action by mixing the flaps and ailerons. It is necessary for the ailerons to be using separate servos, plugged into separate channels and the flap servo to be independent of both aileron channels. Upon applying Crow Mixing, the flaps go down while both ailerons go up.

Crucifix Tail

Crucifix refers to a stabilizer that is mounted part way up the fin. This is a compromise between the conventional tail and the T-tail combining some of the advantages of both.

Crystal

The device that sets the radio frequency of the transmission

Cylinder

The section of the crankcase where combustion takes place

Cyclic

Term used for the horizontal controls used to determine the attitude of the helicopter. Also known as elevator and aileron.

D

DSC = Direct Servo Control

High-end convenience feature which allows control/adjustment of servo function without sending signal through receiver. Requires optional DSC cord (FUTM4250) and DSC-compatible receiver such as R149DP and R113IP.

Dead Stick

Slang term for a landing without engine power. An example: "I ran out of fuel at 50 feet and had to dead stick".

Dialed In

Slang term for the condition in which the model is set up to fly smoothly and predictably. This is the state where the mechanics and electronics work together to produce the best performance.

Differential

Uneven movement in each direction of a control surface. Usually used when discussing ailerons or when describing an undesired unevenness in movement of other controls.

Differential Ailerons

This type of mixing is accomplished by having separate servos on each aileron, plugging one into the aileron channel and the other into another unused channel. The two channels can be programmed to both operate from the aileron control stick, however the travel volume for each aileron may be adjusted separately giving more deflection in one direction (usually up) than in the other.

Dihedral

The degree of angle (V-shaped bend) at which the wings intersect the plane is called dihedral. More dihedral gives an airplane more aerodynamic stability. trainer planes with large dihedral dispense with ailerons and use only the rudder to control the roll and yaw.

Diode

An electronic component which only allows current to flow one direction. Protects the transmitter against reverse polarity or power surges during charging.

Direction of Flight

The relative direction of the wing in relation to still air

Dorsal Fin

An extension of the vertical fin forward of the main part of the fin, and against the fuselage. On the top, or "dorsal" side of the aircraft.

Drag

The air resistance to forward motion. Drag can be increased with the use of certain types of devices installed on the aircraft, such as spoilers, airbrakes, or flaps. Old-style aircraft with lots of supporting wires had very large amounts of drag, while modern aircraft such as military jets, have very low drag.

Dual Aileron Extension or Y-Harness

The Y-Harness is a cable which plugs into a single channel in a receiver and two servos. This allows both servos to be operated from the same channel.

Dual Conversion

A type of receiver that converts the incoming frequency through two intermediate stages. This tends to eliminate the type of interference known as "image". With high-precision components, it also allows the receiver to be much more precise in selecting the incoming channel it accepts. This is what helps the receiver to be very narrow-band.

Dual Rates (D/R)

Dual Rate allows the modeller to choose between two different control sensitivities. With the dual rate switch in the "OFF" position, 100% servo throw is available for maximum control response. In some more sophisticated systems this "OFF" position may be adjusted to provide anywhere from 30% to 120% of normal full throw. In the "ON" position, servo throw is reduced and the control response is effectively desensitized. The amount of throw in the Dual Rate "ON" position is usually adjustable from 30% to 100% of total servo movement. The modeller can tailor the sensitivity of his model to his own preferences.

E

Electric Starter

This is the small motor commonly used to start the airplane's engine.

Electrolyte

A caustic material found in batteries.

Elevator

Hinged control surface located at the trailing edge of the horizontal stabilizer, which provides control of the airplane about the pitch axis and causes the airplane to climb or dive. The correct direction of control is to pull the transmitter elevator control stick back, toward the bottom of the transmitter, to move the elevator upward, which causes the airplane to climb, and vice versa to dive.

Elevator Mixing

Mixes the Elevator and Aileron functions, especially useful for delta-wing models where the elevator and ailerons are the same control surfaces. Each surface is connected to a separate servo (one servo plugged into the aileron channel and the other plugged into the elevator channel), the surfaces will act as both ailerons and elevator, depending on the position of the controls.

Elevator-to-Flap Mixing

Used to apply flaps along with elevators to increase lift, allowing modeler to fly at slower speeds, make tighter loops or turns, etc.

Empennage

The vertical and horizontal tail surfaces of an airplane.

Epoxy

A two-part resin/hardener glue that is extremely strong. It is generally available in 6 and 30-minute formulas. Used for critical points in the aircraft where high strength is necessary.

Expanded Scale Voltmeter (ESV)

Device used to read the battery voltage of the on-board battery pack or transmitter battery pack.

Exponential Rate

Exponential Rate is where the servo movement is not directly proportional to the amount of control stick movement. Over the first half of the stick travel, the servo moves less than the stick. This makes control

response milder and smooths out level flight and normal flight maneuvers. Over the extreme half of the stick travel, the servo gradually catches up with the stick throw, achieving 100% servo travel at full stick throw for aerobatics or trouble situations.

F

FM

Frequency Modulation. This describes the mode of transmission of radio signal from transmitter to receiver.

Fail Safe (FS)

A safety feature which turns a servo to a preset position if the signal is lost or interrupted. Additionally, battery failsafe is a safety feature which brings the throttle servo down to idle as a warning that the receiver battery's voltage is getting dangerously low.

Fairing

A shaped area used to smooth out, streamline, or "fair", the joint between two members of an airplane. A wing fairing joins the wing and fuselage. A landing gear fairing streamlines the landing gear struts, and wheel fairings (wheel "pants") streamline the bulky shape of the wheels.

Field charger

A fast battery charger designed to work from a 12-volt power source, such as a car battery.

"Figure 9"

Can be an "official" competition maneuver, or a badly-done loop. When the model flies over the top of a loop and picks up too much speed, the momentum prevents it from maintaining a loop's round shape.

Fin, Vertical Fin

The fixed portion of the vertical tail surface.

Flapperon Mixing

Mixes the Flap and Aileron functions so that when each aileron is connected to a separate servo (one servo plugged into the aileron channel and the other plugged into the flap channel), the surfaces will act as both ailerons and flaps, depending on the position of the controls.

Flaperons

The movement of two aileron servos, both in the same direction at the same time, acting as flaps.

Flaps

Hinged control surface located at the trailing edge of the wing inboard of the ailerons. The flaps are lowered to produce more aerodynamic lift from the wing, allowing a slower takeoff and landing speed. Flaps are often found on scale models, but usually not on basic trainers.

Flare

The point during the landing approach in which the pilot gives an increased amount of up elevator to smooth the touchdown of the airplane.

Flat Bottom

A Flat Bottom Wing is when the lower surface of the wing is primarily flat between the leading and trailing edges. This type of wing has high lift and is common on trainer type aircraft.

Flex Cable

A flex cable is a special type of pushrod which is very flexible and can bend around corners even more easily than a flexible pushrod. These are generally made with a metal cable running inside a plastic tube and are popular in controlling the engine throttle.

Flight Box

A special box used to hold and transport all equipment used at the flying field.

Flight Pack or Airborne Pack

All of the radio equipment installed in the airplane, i.e., Receiver, Servos, Battery, Switch harness.

Floats

Long, canoe-shaped structures that allow an airplane to land on water. They are not a part of the aircraft structure, but suspended below the fuselage on struts. Also called "Pontoons".

Flutter

A phenomenon whereby the elevator or aileron control surface begins to oscillate violently in flight. This can sometimes cause the surface to break away from the aircraft and cause a crash. There are many reasons for this, but the most common are excessive hinge gap or excessive "slop" in the pushrod connections and control horns. If you ever hear a low-pitched buzzing sound, reduce throttle and land immediately.

Flying Stab

A flying stab is where the stabilizer/elevator is one complete unit which all moves to control the aircraft in pitch.

Flyback

Decrease in angle held by a servo which is being commanded by an AVCS gyro when the input is released. For example, a rudder servo might be at full deflection when rudder input is held. When the rudder stick is released but the model has not yet turned as far as the AVCS gyro has read your input to tell it to move, the servo will continue to hold input. However, it may "flyback" or decrease the angle at which it is holding slightly. This is perfectly normal.

Flying Boat

The type of aircraft where the fuselage has the lower portion shaped like a power boat. The plane lands on water directly onto the fuselage. There may be small floats suspended from the wings to keep the plane level when it's in the water.

FM

FM, or Frequency Modulation, is now the common method and is less prone to interference than AM. Information is transmitted by varying the frequency of the signal.

Foam Rubber

Material that is used to dampen the airplane's vibrations and protect the airplane's battery and receiver.

Four Way Wrench

Combination wrench with sizes to fit glow plug, prop nut, etc.

Fore, Forward

Towards the front. Used such as "...the forward edge of the rib...", or as in "...with fore and aft movement...."

Frequency Flag

The frequency flag is a marker that is mounted on your transmitter to indicate what frequency your system is operating on to alert other modelers so as not to cause interference.

Frequency Control

The FCC has allowed the 72MHz (72.010 - 72.990) band to be used for R/C aircraft operations. This band is divided up into many different channels in which you can choose a radio system. You should be aware that

certain areas have frequencies in which there is pager interference. This is why it is always a wise move to check with your local hobby shop to find out any channels that may be troublesome in the area you wish to fly. The FCC has allowed band 75MHz (75.410 through 75.990) for ground model use only (robots, battlebots, cars, boats), 50MHz (50.800 - 50.980) is allocated only to Amateur HAM license holders for R/C use (and only at 1W maximum power output.)

Fuel Bulb

Rubber bulb used to transfer fuel to model tank

Fuel Overflow Line (Vent)

This line pressures the fuel tank and provides an even fuel flow to the engine. It also functions as an overflow line when the fuel tank is full.

Fuel Pickup Line

This line connects the fuel tank to the carburetor, usually with a clunk on the tank end to keep the fuel flowing while the aircraft is in flight. Fuselage. The main body of an airplane.

Fuselage

The body of an airplane.