

## Glossary (G-P)

### G H L M N O P

#### **Gain**

Gyro sensitivity. When too low, the tail will not hold position well. When too high, the surface being dampened by the gyro will tend to wag, or hunt for center.

#### **Gimbal (or Stick)**

The device that allows the user to input desired control movements into the transmitter

#### **Glide Ratio**

The glide ratio is defined as the distance travelled in a horizontal direction compared with the vertical distance dropped on a normal glide. A 10 to 1 glide ratio means that the aircraft would lose one foot of altitude for every ten feet of distance traveled.

#### **Glitch**

Momentary radio problem that never happens unless you are over trees or a swamp.

#### **Glow Plug**

The heat source for igniting the fuel/air mixture in the engine. When starting the engine a battery is used to heat the filament. After the engine is running, the battery can be removed. The wire filament inside the plug is kept hot by the "explosions" in the engine's cylinder. See next heading and "Idle Bar" plug.

#### **Grease-in**

A very smooth, gentle landing without a hint of a bounce.

#### **Gyro**

A gyro is an electro-mechanical, or electronic device which aids in the control of an R/C model. The gyro senses motion in one axis, and directs the servo to counter that motion. The sensor, which can be a mechanical gyroscope, or an electronic piezo crystal, detects unwanted movement. The gyro then instructs the servo to counter for that motion. At all times, the radio commands will override the gyro command. The level of control the gyro had is adjusted by the GAIN setting.

Mechanical Gyro: uses a mechanical gyroscope (similar to the child's toy) to sense movement.

Piezo Gyro: uses a piezo crystal to sense movement.

Non-Heading-hold vs. heading hold: A standard (nonHH) gyro senses movement and makes an effort to counter that movement as long as it feels it. Therefore, it is NOT going to return the model to the exact

heading prior to the movement. Heading Hold (or AVCS) gyros will lock the model into one position, and accurately correct for movement by sensing rate of change and returning at that same rate.

SMM technology: utilizes a microchip to sense movement and provide all readings. Experiences minimal effect from temperature change, commonly known as 'temperature drift' which affects piezo and some mechanical gyros.

## **H**

### **Handle**

The device for carrying the transmitter

### **Harness**

A device consisting of wires, switches, and a fuse that connects a motor to a battery.

### **Head**

The component which forms the end of the compression chamber of the engine

### **Heading Hold**

This describes a type of Gyro which senses rotation, and maintains direction. This is accomplished by sensing the rate of motion, and the time of motion, then compensating for the distance. While this sounds complicated, the effect is that if you have the model dialed in, and point the nose north, with a heading hold gyro on the yaw axis the model will continue to face north until you command it to yaw. See also Heading Lock. This is not recommended for aircraft use while in flight due to the requirement to use YAW (rudder) command to turn the model. Often used for ground use only for perfect take off and landing runs.

### **Heading Lock**

Slang term for Heading Hold Gyro.

## **HEC**

High Efficiency Clock. High motor pulse frequency, giving very fine control of motor speed, and saving current in the part-load range. Produces longer running times and reduces the thermal load on the motor.

## **Helicopter Radio**

A remote control radio system designed specifically for use with helicopter models. The helicopter radio differs from an aircraft radio in a few ways. First, the heli radio needs mixing functions specific to helicopters, and usually a minimum of five channels. Collective mixing for collective pitch helicopters is a necessity.

Second is the throttle stick, which is ratcheted in airplane transmitters, will not have the clicking feel on the heli version. This is due to the precise control needed on the heli collective stick to achieve and sustain a controlled hover. The specific radio requirements will vary from user to user, and the parameters used will vary from helicopter to helicopter. Note that many radios produced have both airplane and helicopter programming in a single radio.

### **High Wing**

This term describes an airplane that has its wings mounted on the top of the fuselage.

### **Hinge**

The hinges are the moving blades on the control surface that allow you to control the airplane's movement. All hinges must be glued properly and securely to prevent the airplane from crashing.

### **Hit (or to be hit)**

Sudden radio interference which causes your model to fly in an erratic manner. Most often caused by someone turning on a radio that is on your frequency, but can be caused by other radio sources miles away.

### **Horizontal Stabilizer**

The horizontal tail surface at the back of the fuselage which provides aerodynamic pitch stability to the airplane.

### **Hovering Pitch**

This is the amount of pitch you will need to hover the helicopter. On average this is about 5 degrees. Most helicopter radio's will have a knob on the transmitter to vary the amount of pitch at the present hovering stick position.

### **Hovering Throttle**

This is the amount of throttle you will need to hover the helicopter. On average this is about 50% throttle. Most helicopter radio's will have a knob on the transmitter to vary the amount of throttle at the present hovering stick position.

I

### **Idle Up**

This is a setting on the transmitter which limits the throttle minimum. Particularly useful for FFF and 3D stunt flying.

**Immelmann**

A maneuver originally used to reverse direction in combat. The airplane noses up and over onto its back. It then rolls upright and continues in the direction opposite to the original direction. It was invented by the World War I German pilot Max Immelmann, whose airplane could perform the maneuver, and others couldn't. It got him out of a lot of trouble in combat until the Allied aircraft designs caught-up and allowed their planes to perform the maneuver, too.

**Intake**

An air inlet on an aircraft. You can have a carburetor intake, cooling intake, air conditioning intake (on full-size aircraft), and so on. Named because it "takes in" air, and because "intake" is a better-sounding word than "takes in".

**Inverted**

This is when the helicopter is inverted and the functions of the Pitch, Elevator, Rudder can be reversed by the use of the "Inver" switch or the pilot can do it him or her self at the sticks. This is referred to as "Switchless" inverted.

**Inverted Flight Control**

Activates inverted flight programming for helis, which reverses the direction of the rudder, pitch and elevator servos, and sets up inverted flight pitch high-side and low-side. Inverted programming is used to allow the radio inputs to be identical to upright flight while the model is inverted. Note: this approach to hovering is seldom used. Instead, idle-ups are used and the modeler learns to understand and respond to the controls' reversal in inverted flight.

**L****L/D**

Lift divided by drag expressed as a ratio. Essentially the same as a glide ratio. Think of L/D as a glide slope, then, for a given amount of distance the sailplane moves forward, it drops a certain amount.

**Landing Gear**

The assemblies that include the wheels and the wheel struts. The word "gear" is used in the sense of "equipment", as opposed to the "toothed wheel" meaning of "gear". The British call the landing gear the "undercarriage".

**Lateral Balance**

The left-right or side-to-side balance of an airplane. An airplane that is laterally balanced will track better through loops and other maneuvers.

**Leading Edge (LE)**

The very front edge of the wing or stabilizer. This is the edge that hits the air first.

**Long Stroke**

The stroke of an engine refers to the distance the piston travels from top to bottom. In a Long Stroke engine this distance is a bit longer than on the standard engine making the engine a bit stronger in torque and operation lower RPM. Quite often an engine is "Long Stroke" if the stroke distance is greater than the diameter of the piston.

**Loop**

A vertical circle in the air. The plane noses up, keeps rotating until it's on its back, and then comes down and around to describe a vertical circle in the air.

**M****MHz = Megahertz**

The unit of radio frequency. 75 MHz are surface frequencies; 72 MHz are air frequencies; 27 MHz and 50 MHz can be used for either ground or air applications. Note: Use of the 50 MHz (ham radio) band requires an FCC license.

**MPH**

Speed in Miles Per Hour. Like RPM, MPH is both singular and plural.

**mAh (Milliamp Hour)**

A measure of a battery's capacity. The larger the number of milliamp's the longer the battery cell will last.

**Main Gear**

Also Main Landing Gear. The large, heavy-duty landing gear struts and wheels that support most of the weight of the airplane. They are usually under the wing or under the fuselage near the center of the aircraft. Any other landing gear struts and wheels are noticeably smaller.

**Main Landing Gear**

The wheel and gear assembly the airplane uses to land. It is attached to the bottom of the fuselage.

**Metal gears**

Drive gears within a servo which are made of one or multiple metal types. Metal gears tend to wear more rapidly than nylon gears when in the same installation, and so require more frequent service to maintain optimum accuracy; however, metal gears are more durable in the case of severe vibration, flutter, or physical shock.

**Minimum Sink**

The speed at which a sailplane loses altitude most slowly. Usually expressed in feet per minute.

**Mixing**

Allows a single input to control the operation of two or more servos. Simplifies routine flying and allows more involved maneuvers-great for intermediate-advanced fliers. For example, Flap-to-elevator mixing: Most models will change pitch upon deploying flaps (some will climb; others dive). After test flying the model and determining the direction and amount of elevator throw required to correct for this change, a pilot may set a flap-to-elevator mix to compensate. Once the mix is operating properly, when the modeler gives flap control, the radio automatically also gives the proportional amount of elevator throw, keeping the model flat and straight.

**Mixing Arm**

A specialized lever which has three or more pivots. The length between pivots will determine the proportion of the mix between two or more linkages.

**Mode I**

The control stick configuration with the rudder and elevator being controlled by the left stick while the right stick controls the throttle and ailerons.

**Mode II**

The control stick configuration with the ailerons and elevator being controlled by the right stick while the left stick controls the rudder and throttle.

**Mode III**

The control stick configuration with the rudder and elevator being controlled by the right stick while the left stick controls the ailerons and throttle.

**Module**

A removable/replacable plug in unit used in most complex computer radios, containing all frequency control equipment, including the crystal and all tuned components. Changing channels or bands on a modular radio requires only changing module. Changing crystals WITHIN a module to change the channel of the module itself is against FCC regulation and is not recommended. To use your transmitter on a different channel you simply purchase another module on that other channel and the radio is now fully properly tuned and safe and easy to use on that other channel as well.

Futaba module models include TP, TK, TJ, TL, and TK-FSS. For information on which module to use, see 9Z/8U modules, TF modules and aftermarket modules.

**Mounting Lug**

The section of the crankcase used to mount the engine to the airplane

**Muffler**

This device muffles engine noise and increases the back pressure from the engine's exhaust stack, which can improve the airplane's performance at low speeds. Mufflers are usually required by R/C Clubs.

**N****Narrow-Band**

A radio with a 20 KHz band width. All Futaba radios produced 1992 or later and all Futaba FM and PCM radios ever produced are narrow band. Specific list of Futaba narrow band transmitters.

**Needle Valve**

This mechanism within the carburetor adjusts the fuel mixture and throttle. Refer to your engine's manufacturer instructions for directions on how to adjust the needle valve.

**NiCad (or NiCd) = Nickel Cadmium battery**

Rechargeable batteries which are typically used as power for radio transmitters and receivers.

**Nitro = Nitromethane**

A fuel additive which increases a model engine's ability to idle low and improves high speed performance. Ideal nitro content varies from engine to engine. Refer to the engine manufacturer's instructions for best results. Nitro content in fuel is indicated by the percent of the fuel.

**Noise Traps**

A Noise Trap is a small electronic device which is wired into a long servo extension to reduce radio interference and to boost the control signal going to the servo. These are recommended for use where long servo leads are necessary.

**NORRCA**

National Organization for Racing Radio Controlled Autos.

**Nose Gear**

The part of the landing gear that is attached to the nose of the fuselage. The nose gear is usually connected to the rudder servo to help you steer the airplane on the ground.

**Nylon gears**

Drive gears within a servo are made of nylon. Nylon gears show slower wear than metal gears, but are more prone to failure due to severe vibration, flutter, or physical shock to the servo.

**O****OPTO**

Galvanic separation, blocks interference from the motor current circuit, prevents it reaching the receiver.

**P****PA2 = Pilot Assist**

Optional onboard device which uses optical sensors to correct model's orientation to upright.

**PCM = Pulse Code Modulation**

PCM systems use digitally encoded signals to minimize interference and provide today's most advanced R/C control.

**PCO**

Low-voltage protection, gives safely margin when using BEC in model aircraft. PCO cuts off the motor (the main power consumer) in good time, to reserve sufficient battery capacity for a safe landing.

**Peak**

This is the point at which a battery will no longer accept a charge, and converts the energy to heat. This is damaging to the battery pack, and potentially hazardous.

**Peak Charger**

This type of charger will eliminate the guesswork. When the battery has reached peak, the charger reverts to a maintenance charge rate, which will not damage the pack.

**Peak Detection**

Usually refers to a type of battery charger that automatically shuts off when a battery is fully charged.

**Penetrate**

To make progress against the wind.

**Pitch**

Degree of nose up or nose down from level to the horizon.

**Pitch Axis**

The airplane axis controlled by the elevator. Pitch is illustrated by holding the airplane at each wingtip. Raising or lowering the nose is the pitch movement. This is how the climb or dive is controlled.

**Pitch Curve**

The programming function of the radio which aids in setting the hover point, and end points of the blade pitch in the collective mix.

**Pitch Trim**

Offsets the entire heli pitch curve, increasing or decreasing responsiveness proportionally at all points.

**Polyhedral**

Polyhedral refers to the multiple angle wing panels make with the horizontal. A wing with polyhedral has more than two wing panels and the angle of the wing changes at each joint.

**POR - Power On Reset**

Safety circuit; controller does not start working until the throttle stick is set to "off". Prevents the motor bursting into life unexpectedly; an important safety aspect for all modelers.

**Power Panel**

12-volt distribution panel that provides correct voltage for accessories like glow-plug clips, fuel pumps and electric starters. Usually mounted on a field box and connected to a 12-volt battery.

**Prop shaft**

The main crankshaft which transfers the power of the engine to the propeller

**PPM**

Pulse Position Modulation. Another term for FM.

**Pull-Pull**

A linkage set up using two rods or wires. One is pulled for one direction, the other is pulled for the other.

**Push-Pull**

A linkage set up using two rods. One rod pushes, while the other pulls.

**Pushrod**

The rigid mechanism that transfers movement from the servo to the control surface.

**Pushrod Connectors**

The pushrod connector is another means by which a pushrod may be connected to a servo. The connector is mounted onto a servo arm and the pushrod wire is secured by means of a set screw.