

GLOSSARY OF COMMON R/C TERMS

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AC: Alternating current. Current that flows in one direction and then in the other direction.

ACTUATOR: Device for moving or operating a control or surface.

AF: Audio frequency, which see.

ALKALINE BATTERY: Generally the same size and configuration as zinc-carbon types (pen, medium "D"), these usually have longer shelf-life, deliver higher amperage with constant output over longer period, service over wider temperature range.

AMPERE: A unit of measure for establishing the amount of electrical current flow.

AMPLIFICATION: An increase in voltage or current of a signal. The signal may be an audio frequency (up to 16,000 cycles), or a radio frequency. In radio-control, amplification often refers to an increase in relay-operating current.

AMPLIFIER: One or more tubes or transistors, and associated circuitry, used to increase signal strength.

AMPLITUDE: The strength of a radio wave or signal. For example, 6 volts is of a greater amplitude than 5 volts.

ANTENNA: In radio-control, a music wire "rod", or a stretched wire or telescoping "mast", for propagating (emitting) or intercepting (receiving) radio waves.

ARC: Visible electrical spark between electrical contacts, such as in a relay, due to the collapse of the magnetic field of the actuator when signal is cut off.

ARC SUPPRESSION: Arrangement of a capacitor (condenser) and/or resistor or diode "across" the relay contacts to reduce or eliminate arcing.

ARMATURE: A hinged or movable portion of a relay or escapement which is attracted to an electromagnet (magnetic core) when the electromagnet is energized.

AUDIO FREQUENCY: Sound frequencies that can be heard by the ear. This is usually considered the range between 20 and 16,000 cps.

BATTERY: A combination of two or more cells. Its function is to produce an electrical voltage.

BIAS: A voltage that is applied to an electrode of a tube or transistor to make that device operate in a desired manner. In a tube, grid bias is most common.

BYPASS FILTER: A combination of resistors, coils, and capacitors used to pass certain frequencies and prevent the passage of others.

CABLE: Group of wires twisted or grouped to follow a common path.

CAN: Metal box, housing, or container (usually aluminum) enclosing receiver or other circuitry.

CAPACITANCE: The property of a capacitor to hold or retain an electrical charge or voltage.

CAPACITOR: An electrical combination that can hold or retain an electrical charge. Its capacitance is usually measured in microfarads.

CARRIER WAVE: Transmitted radio frequency, or r-f, turned on and off for control, and upon which audio frequency transmitted signals may be imposed.

CASCADE: To join certain actuators to increase the number of sequential controls.

CATHODE: The electrode or filament in a tube which, when heated, emits a stream of electrons.

CB: CITIZEN'S BAND: Frequencies where radio control and communications are accomplished without need of an Operator's test (Station License is required).

CELL: A device for converting chemical energy into electrical energy. Two or more cells make a battery.

CHANNEL: An avenue of control intelligence to the actuator.

CHARGE: The process of restoring the electrical energy available in a secondary battery.

CHARGER: A device to restore secondary battery voltage.

CHASSIS: Base of a receiver or transmitter on which components are mounted.

CHOKER: A coil of wire used to choke off or obstruct certain frequencies.

CLOSED LOOP: Usually a servo in which the electronics is a definite complement to the receiver (also called feedback servo); servo used in multi-control proportional, aligns control surface with transmitter stick position—not an averaged left-right (for ex.) action typical of single-channel magnetic-type actuator.

COIL: A winding of wire on a core, or of heavier wire on a form (which may be removed). Examples: relay coil, tank coil.

COMMON: A wire or point used as a reference point for all voltages in a circuit. Very often the metal chassis of a receiver or transmitter acts as the common point. This term is often used interchangeably with "ground."

COMMUTATOR: A device for changing the direction of a current in an electric circuit.

COMPOUND ACTUATOR: An actuator having an electrical or mechanical means of operating a second, auxiliary circuit or control.

CONDENSER: Common term for a capacitor, which see.

CONTACT: A point at which an electrical circuit may be closed or opened, commonly the relay contacts.

CONVERTER (Power): A circuit and component arrangement that supplies a higher d-c voltage output than the original a-c voltage—possibly eliminating B batteries in tube-type receiver or transmitter.

CORE: Normally understood to mean the iron inner piece, center, etc., upon which a wire coil is wound to develop a stronger magnetic field when energized, as in a relay or escapement. Also, movable iron piece in frequency tuning coil.

CPS: Cycles per second.

CRYSTAL: Precisely shaped and sized quartz used to control the frequency of an oscillator, or as frequency-selective filter in superhet.

CURRENT: Electrical flow measured in terms of amperes.

CURRENT CHANGE: An increase or decrease in amperage in receiver (or relay) circuit as a result of signal reception.

CYCLE: Period of time required for an alternating or oscillating current to repeat original flow direction.

CW: Carrier wave, which see. (Its more precise meaning is continuous wave. Often, these terms are used interchangeably.)

DC: Direct Current. Current that flows in only one direction.

DETECTOR: Section of receiver that picks up signal. (In electronics, the detector is the receiver circuit that separates the modulation on a carrier wave from the carrier wave itself.) In radio-control work, the entire tuner is sometimes referred to as the detector.

DIODE: Tub or crystal designed to pass current in one direction only.

DISCHARGE: Expenditure of electrical energy—as from a battery.

DRAIN: Current drawn or consumed by a tube, actuator, or other electrically operated device, considered in terms of battery capacity.

DROP-OUT: That point at which electrical current flowing through a relay or escapement does not overcome spring tension, thus permitting the armature to pull away from the core piece.

ELECTRODE: An operating element of a tube or transistor.

EMISSION: The process of sending or transmitting radio signals from an antenna.

END-VOLTAGE: Minimum voltage below which battery failure takes place, usually well below useful minimum voltage.

ESCAPEMENT: Mechanical-electrical device or actuator for moving controls or control surfaces.

F.C.C. Federal Communications Commission.

FIELD-STRENGTH METER: Simple circuit arranged with a meter to give relative reading of signal strength. For transmitter tuning.

FILAMENT: An electrode in a vacuum tube heated electrically to cause a flow of electrons to the plate of the tube.

FILTER: A component or coil permitting passage of only desired currents or frequencies. Also, capacitors and/or inductance coils to smooth out electrical currents, as in transmitter power supplies.

FINAL STAGE: Output stage of the transmitter, coming after oscillator amplifier stages: relay stage of a receiver.

FREQUENCY: An oscillating current expressed in cycles per second. (See Audio Frequency; Radio Frequency.)

FREQUENCY TOLERANCE: The plus or minus variation from a stated frequency given as permissible limits for transmission by FCC.

FRONT-END: A tuner for frequency selector section of a receiver.

FSM: See field-strength meter.

GALLOPING GHOST: Simplified form of dual proportional control, giving rudder and elevator action.

GAP (AIR): Distance between armature contact and fixed contact on a relay, and between armature and coil piece on an escapement.

GRID: An element placed between the filament and plate of a vacuum tube to control current flow between the two.

GROUND: Rarely refers to actual connection to the earth; ground point in a circuit is usually considered to be common point where many other parts of circuit connect; in vacuum tube circuits, almost always point (or wire) to which the negative side of B battery, and one side of A battery (either positive or negative) are connected; referring to transmitter antenna circuits, sometimes actual connection to earth.

GROUND CHECK: Checking and tuning of receiver for range by walking it the desired distance away from transmitter.

HARD TUBE: Vacuum tube.

HARNES: Complete wiring system when arranged as a removable unit, prewired and connected outside the vehicle.

HORN: A fixed arm attached to a control surface—connects to pushrod.

IDLE: Plate current of the receiver when no signal is received.

IMPEDANCE: A characteristic of an electrical circuit to oppose the flow of current.

INDUCTANCE: Electrical property of a coil to oppose a change in current flow through the coil.

INPUT: Voltage or current fed into power supply receiver, transmitter, power converter, etc.

JACK: A kind of "socket" placed in an electrical line to receive a phonoplug, etc., for reading of current, or for attachment of earphones, etc.

KEY: Loosely speaking, any form of switch used to make and break the transmitted carrier and/or audio frequencies.

KEYING SWITCH (AND LEAD): The key, and any cable and plug connection to the transmitter.

KICK-UP: Mechanical feature of some compound actuators to move an elevator to the up position.

LEAD: A wire or other conductor, connected to battery, component, receiver, etc.

LEAD-ACID CELL: An electrical cell using dissimilar lead plates and acid. This cell is a rechargeable or secondary type, and has a voltage of approximately 2.

LINKAGE: Mechanical arrangement between actuators and controls.

LOAD: The amount of current being drawn from the battery or other power source.

MA: Milliampere, which see.

MAGNETIC ACTUATOR: Control moving device (usually rudder) incorporating permanent magnet(s) which slaves to variations in pulsed signals from transmitter.

MAGNETIC FIELD: Magnetic lines of force produced by a permanent magnet or current flow in an electromagnet.

MAH: Milliampere-hours.

MEGAHERTZ or MEGACYCLE: A frequency of 1,000,000 cps.

MEGACYCLE: A frequency of 1,000,000 cps.

MEG OHM: A resistance value of 1,000,000 ohms.

MERCURY-CELL: An electrical cell sometimes used, having long life, but not rechargeable.

METER: Device to measure and read voltages, currents, resistances, etc.

METER JACK: See Jack.

MICROSWITCH: High sensitivity precision switch of small size suitable for keying purposes.

MILLIAMPERE: Abbreviated ma or mil. A measurement of current 1/1000 of an ampere, which see.

MIL: Short for milliamperere.

MINUS: Negative voltage.

MODULATION: Imposition of an audio frequency on carrier frequency.

MODULATOR: A circuit used in a transmitter to superimpose an audio or low frequency signal on the carrier wave. In radio-control work, the modulator often consists of an audio oscillator.

MOPA: Master-oscillator power-amplifier circuit used in transmitters.

MULTI: Radio-control class of operation using more than one channel.

MULTIMETER: A test-meter permitting reading of voltages, resistances, currents, etc.

MV: Microvolt, a millionth of a volt, usually a measure of receiver sensitivity.

NEUTRAL: No-control position of an actuator or surface.

NICAD: General term used to describe nickel-cadmium cell. The word Nicad is actually a registered trade-mark of the Nicad Division of Gould National Batteries, but it is frequently used as a term to describe nickel-cadmium cells.

NICKEL-CADMIUM BATTERY: Sealed secondary wet cell, rechargeable; has high discharge rates and long life.

NOISE: Random, audible (on earphones), scratching sounds resulting from electrical discharges—as between vibrating metal parts—which interfere with receiver operation.

NO-LOAD VOLTAGE: Commonly understood to mean the voltage reading of a battery, part of a circuit, when no work is being performed, hence, no current flow (drain) is evident.

NPN: Type of transistor (negative, positive, negative).

NULL: Certain areas in which transmitted signal is weak, or cannot be detected by receiver, due to the antenna type and position—as overhead, with a whip antenna.

OHMS: A unit of electrical measurement for resistance.

OSCILLATOR: A vacuum tube or transistor circuit capable of generating a continuous stream of alternating current.

OUTPUT: The outgoing voltage, current, or signal from an electrical circuit, battery, or generator.

PACK: An assembly of batteries, taped together as an integral power supply for a receiver, servo, etc.

PADDING: Generally refers to special tailoring of a circuit, usually addition of capacity to an audio circuit.

PARALLEL: The joining together of batteries, plus, minus to minus, not to increase voltage, but to increase battery life. Components may also be mounted in parallel, or in series, but not necessarily within the precise meaning of this definition.

PENTODE: A tube having five electrodes—namely, cathode, control grid, screen grid, suppressor grid, and plate.

PHONOPLUG: Metal plug, as used in telephone switchboard, earphones, etc., that can be inserted into a jack. (As with meter jack, transmitter keying cable, etc.)

PIN: Metal prong, as on tube base, for insertion of object in socket.

PLATE: The electrode in the vacuum tube to which electrons are attracted.

PLUG: A device for connecting a cable (as from receiver) into a current—providing tabs for soldered wire connections, and pins for insertion into socket.

PLUS: Positive voltage.

PNP: Type of transistor (positive, negative, positive).

POSITIONABLE SERVO: One which moves to desired control setting, without self neutralization; used for motor control and elevator trim adjustments. (Also called trim servo.)

POT: Short for potentiometer.

POTENTIOMETER: A kind of rheostat for varying resistance of a circuit, as when checking relay operation. A voltage divider.

POWER CONVERTER: See converter.

POWER SUPPLY: Any device used to supply power to an electrical circuit. Most commonly, this is in the form of a cell or battery; it could however, also include a generator.

PPS: Pulse rate per second.

PRINTED CIRCUIT: An etched circuit upon suitable base or chassis eliminating wire connections between components.

PROPORTIONAL CONTROL: Movement of control surfaces, positions corresponding exactly to degree of control stick movement.

PULL-IN: The current value at which a relay or escapement armature will be attracted to the magnetic core piece.

PULSE: Quick, brief signal, either carrier or audio.

PULSE OMISSION DETECTOR: A circuit, either part of receiver, or complementary thereto, used for actuation of motor control in many pulse and proportional systems.

PULSER: Mechanical or electronic device generating as required, transmitted signal pulses of varying widths and rates.

PULSE RATE: Number of pulses per second (pps).

PULSE WIDTH: Duration of individual signal-on pulses.

PUSHROD: Dowel or balsa wood strip, or metal tubing, connecting actuator with control surface.

QUICK-BLIP: Very brief signal used to trip motor control, etc.

RANGE: Distance at which receiver reliably detects signal and provides adequate current change for actuator operation.

RECEIVER: The "radio"; detects, amplifies, and routes signal to appropriate actuator.

REED: Thin, metallic finger that vibrates in harmony, or resonates with particular audio frequency of appropriate cycles per second.

REED BANK: A grouping of reeds to route transmitted and detected tones to proper actuators in multicontrol.

RF: Radio frequency. A frequency that is usually higher than 100,000 cps.

RELAY: An electromagnetic device that is operated by variation in the conditions of one electric circuit to affect the operation of other devices in the same or other electric circuits, by either opening contacts or closing contacts, or both.

RESISTOR: A component to provide any desired number of ohms resistance in a circuit.

SN: Self-neutralizing.

SELECTIVITY: A measure of a range of radio frequency signals within which the receiver will function—the narrower the range the greater the selectivity.

SELF-NEUTRALIZING: Escapement, servo, or actuator that returns to neutral position with no signal.

SENSITIVITY: The quality, or degree of ability of a receiver to detect a transmitted signal.

SEQUENCE: Control responses occurring one after the other in set order, but never selective, as with certain actuators.

SEQUENCE SWITCHER: An auxiliary switching device for closing additional control circuits with a series of pulses. Common to model boats and cars.

SERIES: Usually the connection of batteries, plus to minus, with separate minus and plus leads on respective sides of the pack or box lineup, to boost voltage. Also applies to component hook-ups, but not precisely in this sense.

SERVO: An electric-motor driven control actuator.

SHORT: Accidental, direct contact of parts or conductors having opposite polarities. "Short circuit."

SHORTING PLUG: Converted (both sides connected) phonoplug, or other miniature plug, inserted and remaining in open-circuit jack to maintain closed circuit. Sometimes placed in closed-circuit jack in airplane to ensure reliable circuit through jack when contacts have poor pressure.

SIGNAL: Controlled transmission of carrier or audio frequency.

SILVERCELL: Miniature, secondary wet cell, rechargeable battery capable of high discharge rates and extreme battery life. Usually employed for high-drain servo operation. (Registered trade name of Yardney Electric Corp.)

SIMPL-SIMUL: Simplified form of pulse control for proportional simultaneous movement of elevators and rudder.

SIMULTANEOUS: Two controls at a time, as with multi, by transmission of two tones.

SINGLE-CHANNEL: System in which receiver provides only one path of intelligence to actuator, or primary actuator.

SINGLE-STAGE: Transmitter having oscillator but no amplifying stage.

SLUG: In a relay a slug is a highly conductive sleeve placed over the core to help increase or decrease the magnetic lines of force within the magnetic path. The slug is also taken as a metal core whose position can be varied inside the coil.

SOCKET: Device, part of circuit or circuits, to receive the plug connecting the receiver, etc.

SPAGHETTI: Thin-wall tubing.

SPRING TENSION: The amount of pull exerted on a relay or escapement armature by the return spring.

STAGE: That portion of a circuit in a transmitter or receiver performing one function of the operation, as detection, amplification.

SUPERHETERODYNE: A radio receiver having high amplification and selectivity. It contains its own oscillator, the output of which mixes with the incoming signal to produce an intermediate frequency signal.

SUPERREGENERATIVE: Commonly used radio-control receiver with good sensitivity, relative simplicity, but poor selectivity—susceptible to interference.

TANK: Coil and capacitor circuit employed in receiver and transmitter to help establish natural frequency of the radio circuit.

TERMINAL: Soldering lug, post, etc., to which connection may be made.

TOLERANCE: Permissible deviation, plus or minus, expressed in a percentage, as for crystal, resistor, capacitor, etc.

TOPE: An audio frequency, expressed in so many cycles per second, superimposed on a carrier wave.

TORQUE ROD: Balsa wood, dowel, or metal piece extending from an escapement to a surface, for transmitting the actuator movement to the control. (Rocking motion contrasting linear motion of a pushrod.)

TRANSMITTER: The electronic circuitry that generates and sends out a controlled radio frequency, or both this r-f and audio frequencies, or tones.

TRANSISTOR: Basically, a semiconductor for specific purposes, such as signal detection, power amplification—has many properties of a vacuum tube, but low current consumption.

TRIM: Final adjustment and balance of a model plane to realize proper flying characteristics; precise non-neutralizing actuation of a control.

TRIODE: Type of vacuum tube having three electrodes, for filament (cathode), grid and plate.

TRICKLE-CHARGE: To charge at a very low rate for a long period—common in radio-control work with nickel-cadmium batteries, etc.

TUBE, VACUUM: Glass bulb from which air has been exhausted, having varying, required electrodes for specific function, such as detection, amplification, modulation, oscillation.

TUNER: Usually, a variable capacitor—coil combination for adjusting capacitances or inductances to facilitate proper operation of a transmitter or receiver.

VIBRATOR: A power pack consisting basically of a vibrator and transformer, capable of changing a low value d-c voltage into a high value a-c voltage. Often the word "vibrator" alone, is used to describe the entire pack.

VOLT: A unit, or measure of electricity indicating pressure.

VOM: Volt-ohm meter, a measuring instrument with multiple ranges and scales.

VTVM: Vacuum tube voltmeter.

WATT: A unit or measure of electricity indicating power consumed (volts \times amperes).

WAVE: An actual diagrammatic representation of a radio wave to illustrate frequency, amplitude, etc.

WET CELL: A form of battery, rechargeable.

WHISKER WIRE: Tiny contact wire attached to revolving shaft of an escapement to close auxiliary circuit.

YOKE: Formed steel wire, as a loop, placed about a drive pin inserted into the surface to be moved.