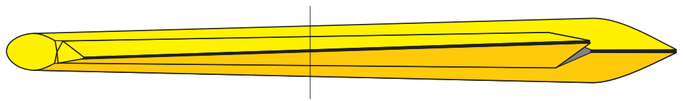
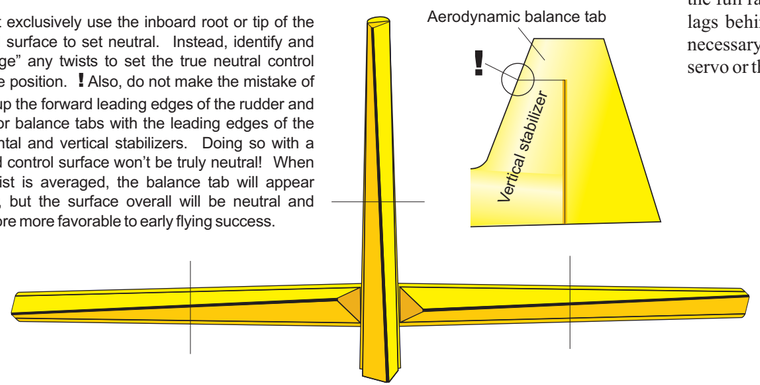
Setting True Control Surface Neutrals

Some of the obstacles that pilots encounter stem from a fixation on lining up only part of the control surface at neutral and failing to step back and look at the position of the surface overall. Note that most lightweight wood ailerons, rudders and elevators are inherently twisted for part or all of their length, and thus you should never exclusively use the inboard root or tip of the control surface to set neutral. Instead, you must look at the entire length of the control surface and identify any twists or bows, and then "average" the twist to set the true neutral position. E.g., a little down at the tip, up at the root, and neutral at the half-span, is true neutral! Furthermore, to reduce the potential for programming errors, and to simplify the fine tuning process at the flying field, as a rule, always try to mechanically set the control surface neutrals, and only use the radio to fine tune things when it becomes absolutely necessary.



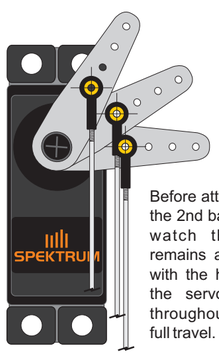
(Full length twisted aileron example) Half span = true aileron neutral

Do not exclusively use the inboard root or tip of the control surface to set neutral. Instead, identify and "average" any twists to set the true neutral control surface position. ! Also, do not make the mistake of lining up the forward leading edges of the rudder and elevator balance tabs with the leading edges of the horizontal and vertical stabilizers. Doing so with a twisted control surface won't be truly neutral! When the twist is averaged, the balance tab will appear askew, but the surface overall will be neutral and therefore more favorable to early flying success.



(Twisted elevator halves example) Despite one elevator looking like it is up, and the other down, they are actually both neutral when the twists are averaged.

This is a good place to mention that when setting up dual servos on a single aileron, only connect one servo to the control surface. Then line up the other ball link with the hole that will be used on the other servo arm and watch that the ball link remains lined up with the servo arm throughout the full range of travel. If the 2nd servo ball link lags behind or outruns the servo arm, make the necessary adjustments to avoid damaging the servo or the control surface.



Before attaching the 2nd ball link, watch that it remains aligned with the hole in the servo arm throughout the full travel.

KPTR: Amidst all the programming distractions, don't forget to step back to see whether the setup looks correct overall.

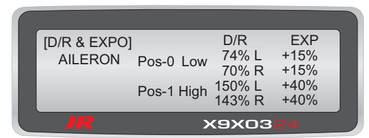
Dual Rates/Flight Modes/Conditions and Travel Considerations

While a computer radio with dual rates/flight modes and exponential is not mandatory for flying precision aerobatics, it's a great asset when fine tuning the airplane's handling to make it easier to fly, and a must to fly 3D. Typically, "high rates" are set up to achieve maximum travels for extreme 3D flight and taxiing in strong winds, whereas "low (normal) rates" provide optimum travels for precision aerobatics, takeoff and landing.

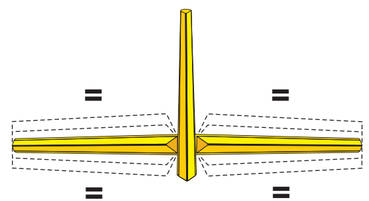
While it might sound like dual rates would enable precision aerobatic pilots to ideally set up different control responses for different maneuvers, those who do so often end up taking longer to achieve proficiency because they are, in effect, having to learn to fly TWO different handling airplanes! Just like driving a car, it proves to be much easier to master one consistent setup and learn to change the size of your control inputs depending on the situation than to try to juggle different rates. Therefore, it's recommended that dual rates principally be used to switch between precision flying and extreme stunt or taxi mode. Tip: When using dual rates, it's recommended that all the dual rate (and expo) settings be put on one switch to make it simpler to switch back and forth.

! Page through any R/C magazine today and it's obvious that 3D flying is a major influence on the sport. Because 3D tends to bias manufacturers to recommend larger control surface deflections for both high AND low rates, most pilots will find it immediately necessary to reduce the manufacture's low rate percentages to be able to takeoff, maneuver, and land comfortably. Notice: When setting up the control surface travels or making adjustments, it is critically important that you physically measure the control surface deflections in ALL directions! For a variety of reasons, it is very likely that you will have to program different percentages to achieve the same control surface travel in both directions. Pilots often neglect to physically measure all the control surface deflections in both directions because they assume that things are equal based merely on the "numbers" they read off of the transmitter. Consequently, some pilots end up unhappy with the way their planes handle, or assume that having to make numerous and/or large adjustments at the flying field is an indication of a faulty design. In some cases there may simply be more left aileron travel than right, or one elevator half deflects more than the other, and except for that their airplanes are fine.

Note: Remember to continually re-check the positions of the curser, D/R, and flight mode/condition switches when programming the high rate, low rate, and exponential settings for each control. (Sooner or later everyone, including the pros, overlooks this and has to go back and reprogram -- assuming they catch it.)



Different percentages are often required to achieve equal deflections on the actual control surfaces in both directions.



! KPTR: Transmitter settings should be based on actual deflections and your current skill/comfort level, not #'s on a screen!