

# Freestyle aerobatic flight groups

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**N**o two people fly in exactly the same way, so transmitter program setups vary from pilot to pilot. Everyone has his own favorite “feel” when it comes to airplane setups, so there really is no single right way to set your model up for 3D competition. In this article, I offer the setups that I have found best for performing all the Aresti and freestyle maneuvers.

Today’s high-end radios can help your flying a lot. Top fliers use the best radios because they need them for the top-level flying we expect of them! During many years of competition, I have found that flying consistently is the most difficult skill to acquire and also that it’s the key ingredient to winning. Every flight and every maneuver you execute must be the best you can do. High-end radios help us with this. They offer a substantial advantage over standard radios, and almost everyone in aerobatic competition uses them.

## SETUP DIFFERENCES

Today’s aerobatic airplanes are capable of flying a wide range of maneuvers, and all of which are flown at different airspeeds. Because of this, not every maneuver requires the same rate, expo, or mixing settings. Let’s take hovering and rolling circles, for example. With the same control settings, it would be very difficult to fly both maneuvers consistently well. You have to set your model up for each individual maneuver and then switch the settings to do each one.

Basically, you could do every maneuver while having full deflection (more than 45 degrees) on all controls, but this would result in some maneuvers being over-controlled, and that would obviously affect the consistency of your flying. You just can’t do a good snap roll with the same control throws as you use for a “waterfall.” You need a 150-percent rate on all three controls (ailerons, rudder and elevator) to do the waterfall,

but a nice snap roll requires around 90 percent deflection for ailerons, 30 percent for elevator and 40 to 50 percent for rudder. It is nearly impossible to set this many control rates using only your thumbs. Proper radio programming is crucial to achieving top-level, consistent performance.

## THE BASIC GROUPS

I arrange the various aerobatic maneuvers into groups, and then I assign each group a flight-mode setting.

The basic aerobatic maneuver groups are:

- General flight
- Spins
- Snaps
- Rolling circles
- 3D

I assign a particular flight-mode switch to each group. By doing this, I need only flip one switch to change all the rate and exponential settings that are specific to a group of maneuvers. I can also fine-tune group program adjustments without affecting the settings in other groups.

## GENERAL FLIGHT (GF)

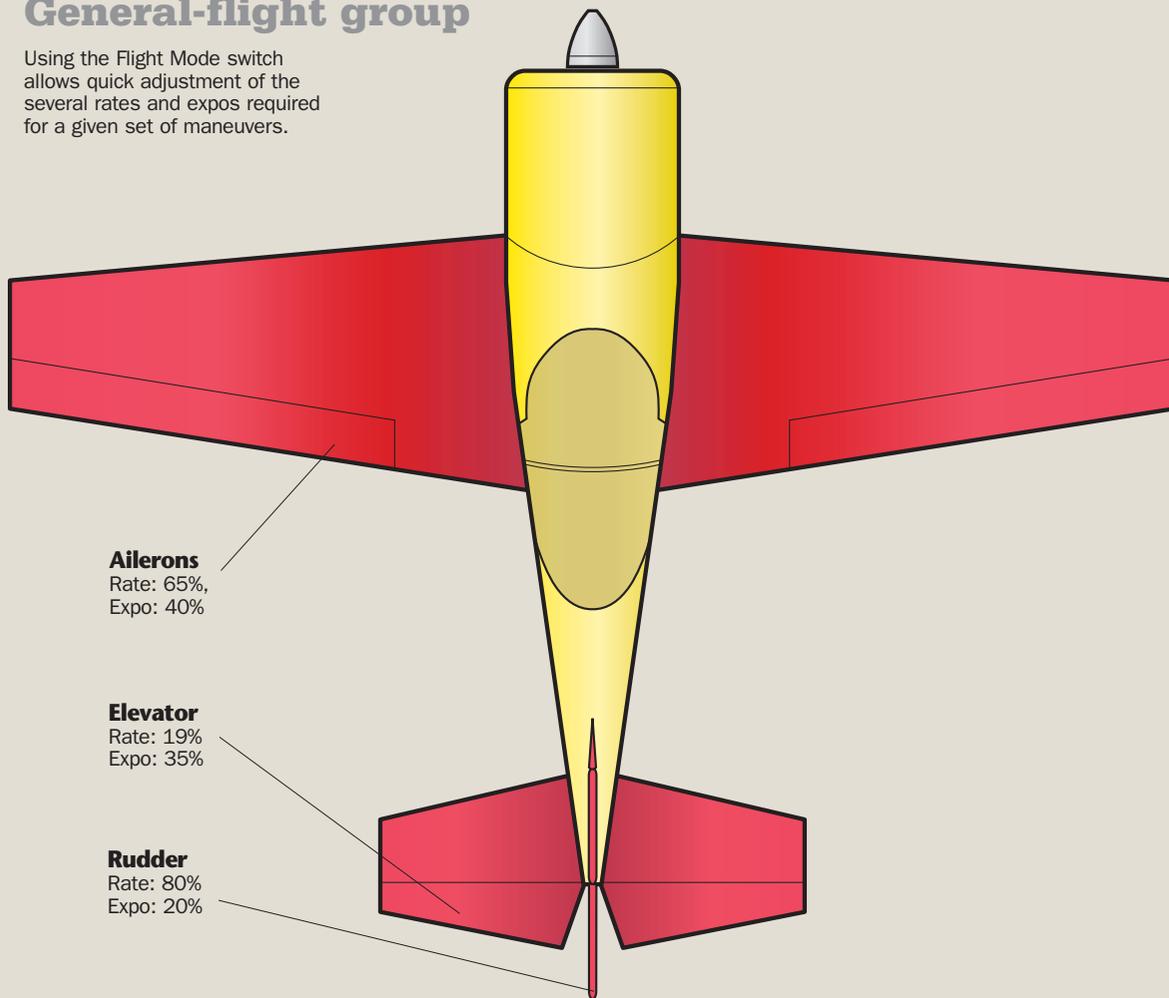
My GF group includes all the maneuvers that are not included in the other groups, with the exception of stall turns. The GF mode contains the control set-



**Entering the various Rate and Expo values is easy with JR's 10X programmable transmitter.**

## General-flight group

Using the Flight Mode switch allows quick adjustment of the several rates and expos required for a given set of maneuvers.



things that will allow me to best perform maneuvers such as rolls, point rolls, loops, corners, vertical lines, 45-degree lines, landings and takeoffs. I've set all the rates and exponential settings so that I can perform these maneuvers smoothly. The amount of rates and exponential adjustment for the GF group can vary quite a bit for different types of airplanes. As a rule, I use the minimum amount of elevator needed to fly the various maneuvers smoothly. The 135-degree corners require the highest elevator rate, so it sets the highest rate amount for the entire group. Using minimum elevator rates to do maneuvers means that you

need less exponential, and I think this is the way to go!

I use whichever aileron-rate setting I need to keep the roll's rotation rate constant at the top of a vertical line. For example: when flying a 3-roll vertical line, I want the last roll to be at the same rate of rotation as it was for the first one, even though the airplane loses airspeed during the climb. You must have the extra aileron rate setting to keep the rotation rate constant. Finding out what this extra amount is takes time and practice.

I like a good rudder response, so my rudder-rate setting is probably above the average. I fly Mode I, so I control the rudder and ele-

vator with my left thumb. When I roll the airplane horizontally, I use elevator and rudder inputs to keep it in a level, horizontal line. I try to set it so that thumb travel up and down and right and left is the same. A diagonal stick-travel pattern makes it easier for me to perform the maneuver.

The general flight-rate settings for my Yak-54 TOC are:

### EXPONENTIAL (EXPO) CONTROL

This is also a great feature, but using too much expo softens the feel around the neutral stick position to a point at which your control is affected. I generally use as much exponential as I



Depending on the number of setups, you can assign flight modes either to a dual-rate switch or to the large mix switch on the transmitter's top right.

can without affecting my flight precision. Again, you need to practice and experiment to find the correct amount.

### PROGRAMMABLE MIXING

This is another important radio feature for maximizing your airplane's performance. In general, I try to keep electronic mixing to a minimum, but in some cases, I have to use it. The most popular programming mixes are rudder to elevator, rudder to aileron and throttle to elevator. In the first two cases, the mixing amounts are adjusted to correct for any pitch or roll coupling that occurs during rudder input—usually while flying in knife-edge. The best type of mixing for this is multipoint, which will allow you to adjust the amount of mix from point to point over the full range of rudder movement for both left and right deflection. When adjusted correctly, the mixing function will allow the airplane to fly through a knife-edge loop using only rudder input; elevator correction inputs won't be required.

Use the “throttle to elevator” (T-E) mixing to keep long, vertical downlines perfectly straight. Of course, your airplane's CG location, wing incidence, etc., will also affect this. Most airplanes have a slight tendency to pull toward the canopy (upward) after a long downline. To check this, take your airplane very high (about 1,000 feet), and then reduce the throttle to idle, push it down into a perfect vertical downline and watch what the airplane does. Most airplanes will go perfectly straight and will show only a slight tendency to go to the canopy side, but some may tuck under toward the belly. In either case, use the T-E mixing to correct the downline. This mix is stick-position-activated, meaning that you program the throttle-stick position to set the mix. I normally set the T-E mix to be activated at one click above the full idle position. That last throttle click before full idle turns the mix on. As a rule, this mixing should never exceed 2 or 3 percent.

That's it for the general-flight group adjustments. Next time, I will cover all the rest of the flight groups and how to adjust the programs for each.