By John Glezellis Illustration by FX Models

The Flat Spin to a Blender

Master this move in four easy steps

We recently discussed uniting upright and inverted spins. This month, let's build on this type of maneuver and take it one step further. Advanced aerobatic pilots are always looking for combinations of elements that, together, can form new and innovative aerobatic moves.

Years ago, during the freestyle event at the Tournament of Champions in Las Vegas, Nevada, I was watching Quique Somenzini combine a flat spin with a blender while recovering at a very low altitude. Watching him perform this combination was simply stunning. At first, the aircraft entered what everyone thought was going to be an ordinary upright flat spin. Then his model quickly transitioned to a rolling vertical downline, where he then performed the blender, which contained an abrupt transition to an inverted flat spin. If you are looking for something new to try, this is a particularly demanding maneuver that is sure to please.

BEFORE WE BEGIN

For you to experience success, you need the required aerobatic skill and your aircraft must be properly set up. This combo requires fairly large control surfaces, coupled with large surface deflections, as well as the proper center of gravity (CG). As a starting point, begin with the control-surface deflection amounts, exponential settings, and the CG recommended for your model.

With respect to control-surface deflection, the entry spin as well as the transition into the inverted spin during the blender will require anywhere between 35 and 45 degrees of control-surface deflection for the elevator, rudder, and ailerons. Additionally, enough exponential should be used to soften the response of the aircraft. For my 3D flight mode, I typically use around 65% of exponential.

In the most basic form, flight modes contain dual or triple rates for all control surfaces on a single switch. Different mixes and other desired functions can also be applied to certain switch settings, but in the interest of this column, multiple rates are mandatory for consistency upon entry and exit for the figure. When you enter the spin, for example, you should be on your 3D flight mode to ensure an extremely flat spin rotation. Push the model into a vertical downline where you begin rolling and perform the blender. A rate change is not required for this figure, but once the aircraft completes the maneuver, the pilot should return to the low-rate setting to manage the position of the aircraft. Once the airspeed increases, return the rate to a reduced setting.

OVERVIEW

For your first few attempts, altitude is very important. Enter the maneuver into the wind and parallel to the runway. During the rolling segment, altitude will quickly be lost, so start at about 700 feet. Decrease throttle and gradually feed in up-elevator to maintain altitude while using the 3D flight mode. As the aircraft comes to a complete stop and stalls (ideally directly in front of you), it will drop a wing. Continue holding up-elevator and apply the required control commands in the direction of the stalled wing, which include aileron and rudder in the same direction coupled with maximum up-elevator. Only a touch of aileron is needed during the rotation for an extremely flat rotation. If the aircraft doesn't stall and begins to descend while at a nose-high angle, simply add a touch of aileron and full rudder in the preferred direction.

After a few rotations, release all control inputs but continue holding aileron in the same direction as the rotation. After a roll or two, continue holding aileron input but apply full down-elevator and opposite rudder to execute the inverted flat-spin portion of the blender. To exit, neutralize inputs and establish a vertical downline. Push elevator to an inverted exit. With practice, you can also add some flair by exiting the figure with an inverted harrier.

BY THE NUMBERS

Step 1: Fly the airplane parallel to the runway and at a very high altitude. When ready, switch to 3D flight mode and begin to gradually decrease throttle; as the airspeed begins to slow down, apply the required amount of up-elevator to maintain altitude. For this figure, the goal is to have the model come to a stop and stall directly in front of the pilot. At that point, a wingtip will stall and the aircraft will favor a certain direction, as mentioned earlier. In the case of the illustration, the left wing dropped, producing a left-hand flat spin rotation.

Step 2: At the time of the stall, the pilot should apply full left rudder, a touch of left aileron, and full up-elevator. If too much aileron is applied, the aircraft will not perform a flat rotation and will, instead, perform what appears to be an inside tumble. Once a rotation or two has been completed, depending on your altitude, start to enter into a rolling vertical downline at a fairly slow roll rate.

Step 3: To begin the inverted spin, apply full left aileron followed by full right rudder and full down-elevator. Decrease the aileron input, as needed, to maintain a flat rotation. Depending on your aircraft, you can experiment with different throttle settings to further flatten the inverted spin rotation. This produces a lot of stress, however, and so requires a structurally sound model.

Step 4: To complete the figure, release control inputs and establish a vertical downline. Let the aircraft gain some airspeed, switch to your low-rate flight mode, and push 90 degrees to an inverted exit. Continue to use enough down-elevator to maintain straight and level inverted flight.

FINAL THOUGHTS

Remember, some models might perform a relatively flat spin, both during the upright segment as well as the inverted portion during the blender, whereas others might not. If you have trouble mastering this maneuver, don't become discouraged. It is important to analyze your situation and check the CG (it may require adding a touch of tail weight). Also, your airplane might not have large enough control surfaces or enough control-surface deflection, so experiment with your setup until you find the proper combination.

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