

This document details the setup for the Blade Sport Jet

The Blade is delta wing sport jet designed to allow the modeler to experience the aerodynamic advantages a delta wing aircraft. The highly swept leading edge, combined with ample fin area, allow the Blade to achieve high angles of attack while maintaining solid stable flight characteristics. High-speed flight likewise, is rock solid as the long fuselage and chord length provides for smooth and precise pitch, roll, and yaw handling.

Setup of an aircraft is what it's all about to get the most performance from any wing, and on a flying wing type aircraft this can become even more critical. The following setup is the one I am using for sport flying my Blade with a JR 10SX radio system. I have taken advantage of many programming features, and these features are common on most modern computer radios.

The Blade uses elevon's for combined elevator and aileron control. It also has twin rudders with separate servos for each rudder. The nose gear steering has its own servo to allow separate operation. You can put each servo on its own channel allowing the maximum flexibility in control features.

The use of quality servo's on all flight surfaces is a must at the speeds turbine powered model aircraft fly. The JR 4321 servo works well on the elevon's. The narrow Volz Wing-Max servo is ideal for use on the rudders providing plenty of power and narrow design that can fit entirely within the narrow fins of the Blade. Note: I do not use a gyro on the Blade as the excellent flight and ground handling characteristics negate the need for a gyro on this model.

Control Setup

Surface	ATV	Dual Rate	Travel	Dual Rate	Expo
Elevon Elevator – Neutral is ½" above trailing edge.*	100%	High	+ 1 ¼" (1 ¾" Actual) - 1 ¼" (- ¾" Actual)	100%	5 %
		Low	+ 1" (1 ½" Actual) - 1" (-½" Actual)	80%	4%

Elevon Aileron -	High	+ 3/4" (1 1/4" Actual)	50%	5%
	Low	-3/4" (- 1/4" Actual) + 1/2" (1" Actual) -1/2" (0" Actual)	40%	4%
Nose Gear *Rudder Channel	High	+/-20 degrees	100%	25%
	Low	+/-10 degrees	50%	12%
Rudder Travel (Flap& Aux 4 channels) Flap Drag Brake		+ 1" left - 1" right Both rudders in 1"	60%	0%

Start programming the JR 10SX transmitter by selecting from the Wing Type (22) the Elevon type wing. Program the elevon travels per Table 1, Control Setup. Note all ATV travel volumes are set to 100%. These recommended parameters were developed to allow a wide flight envelope while still maintaining conservative travel for smooth flying. The high rate elevator is for normal flying with low rate available for smooth high speed flying if desired, though I seldom switch to low rate elevator. The low rate aileron is my preferred flying mode with high rate aileron available for those high roll rate rolls.

The rudder setup utilized is complex, but it is done to simplify the flying of this model. Each of three servo's, the nose gear servo, the left rudder servo, and the right rudder servo are each controlled on their own channels allowing the maximum utilization of the mixing features of our modern computer radios. The nose gear steering servo is plugged into the rudder channel, the left rudder is plugged into the flap channel, and the right rudder is plugged into the aux. 4 channel.

The rudder channel is the master over the flap and aux. 4 channels. This is done with Program Mix 1 (51) and Program Mix 2 (52). Again the ATV settings for these three channels are at 100%. Setup the linkage to obtain the correct travels. Program Mix 1 and 2 are used to mix the rudders to the rudder channel for normal rudder movement. Program Mix 3 is used to setup the Flap control to move both rudders in as drag brakes. This is used during the landing approach to aide in approach control, and to provide some up trim to establish a comfortable glide speed on approach.



Turn off the trim effect to the flap channel and the aux. 4 channel. Rudder trim is now only active to the nose gear steering allowing precision adjustment for straight taxi and takeoff without affecting the flight rudder trim. Now the fun, the flap channel is master to the slaved aux. 4 channel. Turn off the aux. 4 channel control knob so you cannot inadvertently move the neutral point of the aux. 4 servo (right hand rudder). Set the travel for the aux. 4 channel in reverse of the flap channel, this will turn both rudders in as drag brakes as the flaps are applied. Carefully adjust travel so both rudders move equally. See Table 2 Rudder Program for mix setup.

Rudder Program

Prog. Mix 1	Ruddà Aux 4	POS	-100%
			-100%
Master	Trim		
Norm	Off		
Prog. Mix 2	Ruddà Flap	POS	+100%
			+100%
Master	Trim		
Norm	Off		

Prog.Mix 3	Flapà Aux4	POS	+63%
			+88%
Master			
Norm			

Now lets discuss the balance of the model. All CG, center of gravity measurements are taken from the leading edge at the wing to fuselage mating area. I have flown the model with the CG varying from 4 ½” to 5 ½”. The best setup is between 5” and 5 ¼” from the leading edge. Things to consider in your selection of the best CG, too far forward and the model will take an excessive amount of down elevator to hold the inverted position and likewise, will require greater rudder travel to hold knife edge flight. The suggested rudder travel holds knife edge flight well at the 5 ¼” CG position. Another problem with a nose heavy airplane, it takes a lot of up elevator to setup the glide speed for the landing approach. Most nose heavy airplanes cannot be landed as slowly as the wing will allow the plane to land because the maximum angle of attack cannot be achieved due to the nose heavy condition.

The far aft CG of 5 ½” works well for normal flying, but you can get into certain situations that may leave one uncomfortable. I also find it is a bit too far aft during landing as the elevator response is no longer linear during the landing approach and flare to landing, especially when low on fuel. It is much easier to land at 5 ¼” CG. The Blade should be all set now to enjoy flying, good luck and see you at the field.