

4-Servo Elevons for NX10 and DX9

Why 4-servos?

1. Safety. If one servo fails, for example, with broken nylon pinion gear teeth, landing safely is possible due to redundant control surfaces. Pinion tooth failure usually occurs when servos are back driven a few times by control surfaces colliding with immovable objects during ground transportation or storage.
2. With 4-servos, control surface linkage forces and stresses are also lower, which reduces servo wear and current draw. This method also allows use of aileron differential.
3. This example is for top of wing linkages and a 6-channel receiver.

For models with control linkages on bottom of the wing, select Elevon. For models with linkages on top of the wing, select Elevon-B. Video below shows how this works on a light weight foamy with a rudder. Additional information on aileron servo mounting conventions and what works best with Spektrum Airware is provided to simplify transmitter programming for this and other designs. Some basic concepts are also identified for pilots new to RC.

To get started:

Create a new model.

Model Type: In this case Airplane

Model Name: As you like.

Aircraft Type:

Wing: Elevon-B (for Elevon if linkages on top of wing)

Tail: Normal

Physical mounting of Servos and Connection to Receiver Ports

Assumptions are that when you are mounting aileron servos, you put them in the same orientation working from the wing centerline out. So, bottom of the servo toward the fuselage on both wings, or bottom away from the fuselage on both wings, or bottoms up, or bottoms down. This makes it so that a simple Y-cable drives both sides of the model properly and Elevon type works as described above for top or bottom mounted linkages.

Get the first pair (left and right outer pair) working properly by checking their movement. For linkage on top of wing, use Elevon-B wing and reverse servo travel for both LAL and RAL. LAL must be connected to Aileron receiver port (2) and RAL connected to receiver port (3). **You must do this first, before you connect the second pair of elevons.**

Next you select which two receiver channels are going to be the second inner pair. On this model with a rudder, I want to use **GEAR and AUX1** outputs of the receiver, the next two available ports. You could just as well use AUX1 and AUX2 or other available ports.

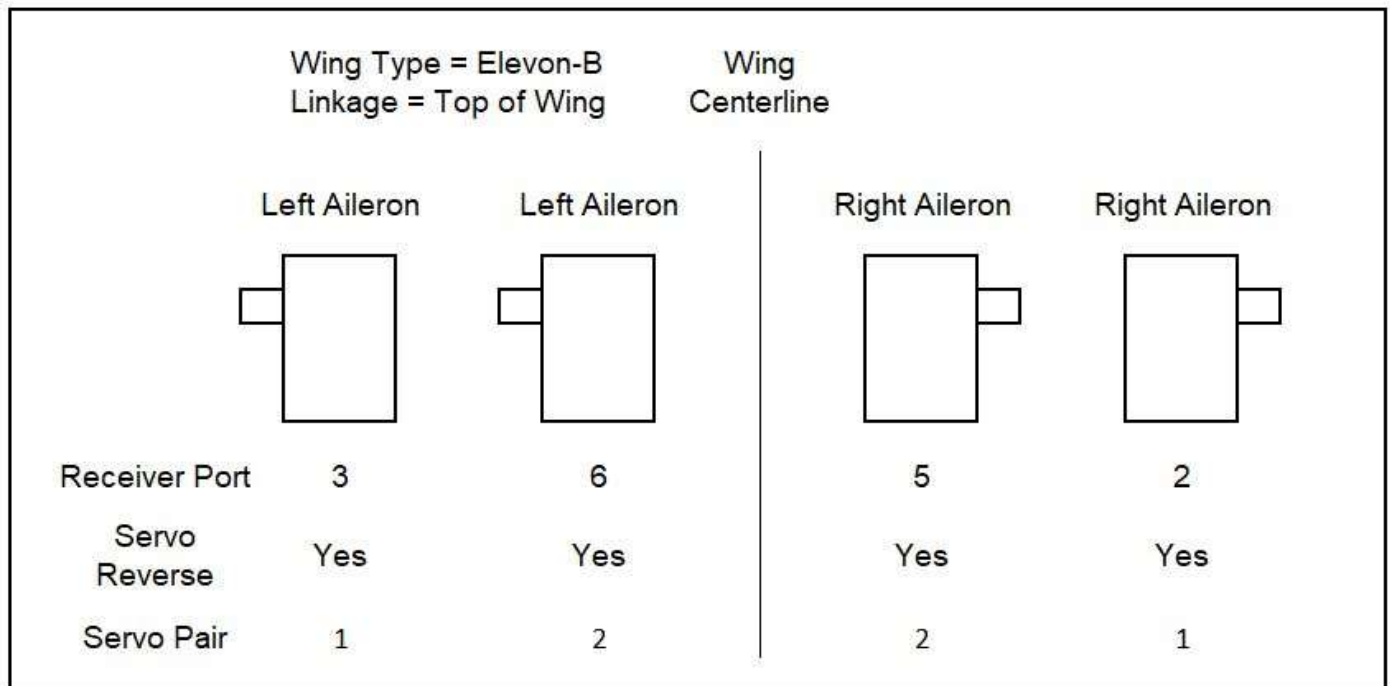
Go to System Setup > **Channel Assign** screen, then select NEXT to get to Rx Port Assign screen. Go down to GEAR and change the input to Left Aileron. Now change AUX1 to Right Aileron and plug the servos into those channels.

Finally, in Function List > Servo Setup, go to **Reverse** and reverse the second entries of LAL and RAL. Again, check to make sure servos are moving in the correct directions.

Chart below shows recommended servo orientation but may not be the only solution.

Note: Wings with control linkages on bottom of wing may not require reversed servos.

Physical Orientation of Elevon Servos with Linkage on Top of Wing



To Facilitate servo setup, use servos with an odd number of servo output splines if you want all 4 servo arms 90 degrees from the servo case. See Servo Horn Arm Spline Count [Article](#).

On some models, servo arm orientation can be used for Aileron Differential.

If you get it working on DX9, it will work the same on NX10. No changes needed.

Videos & SPM File:

[4-Elevon Servos on Foamy](#)

[Test Servo Mounting Before Installing](#)

[Aileron Differential](#)

[Dx9 SPM File](#)

[Updated 4-Elevon Setup from 1/17/2015](#)

Wings With 2 Flaps:

When laying out 2-flap systems, people commonly put all servo bottoms facing left or right (vs. the fuselage centerline for ailerons) - this means a simple Y-cable will work the flaps properly.

There are other 4-servo designs that may use Y-cables, or 2-elevator and 2-aileron, or you can offset servo arms to create some aileron differential. Use your imagination and experiment with [what works best for you](#).