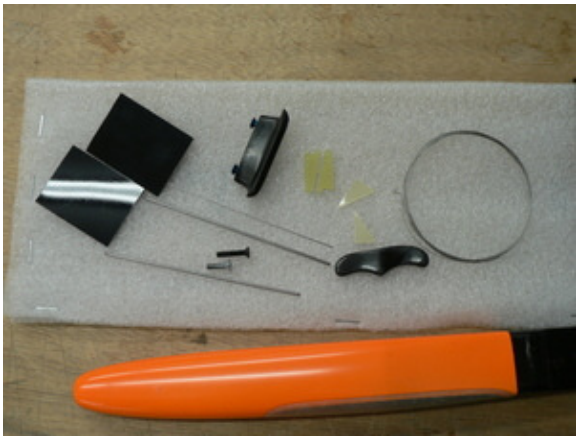
Stream NXT - assembly instructions

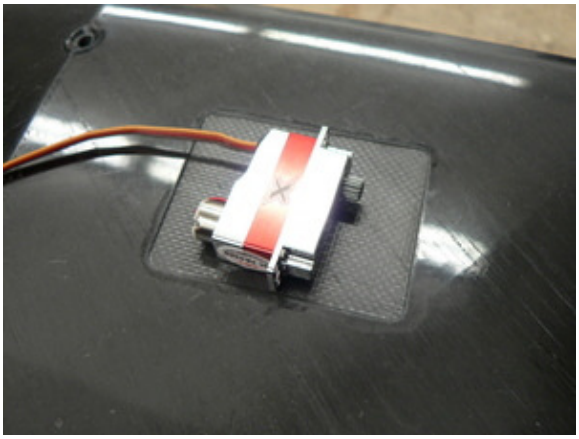
Recommended settings

CG (measured from root leading edge):	65-70mm
Speed/launch camber (+down, near the wing root):	0mm
Cruise camber (+down, near the wing root):	+2mm
Thermal camber (+down, near the wing root):	+5...+8mm
Aileron deflections (+down, -up):	+12/-12mm
Elevator deflections (+down, -up):	+9/-9mm
Rudder deflections (+left, -right):	+15/-15mm

Kit contents: wing, fuselage, tail feathers, small parts.

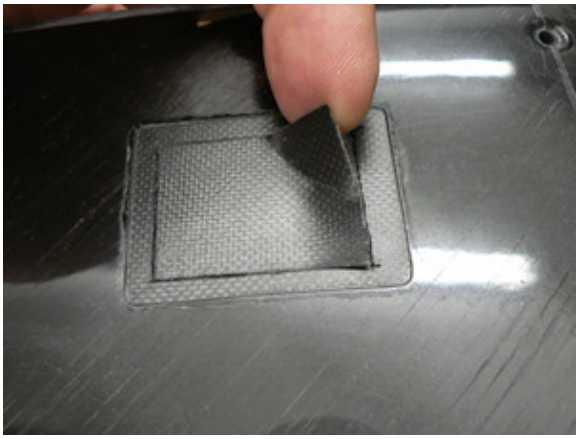


Small parts supplied with the kit.



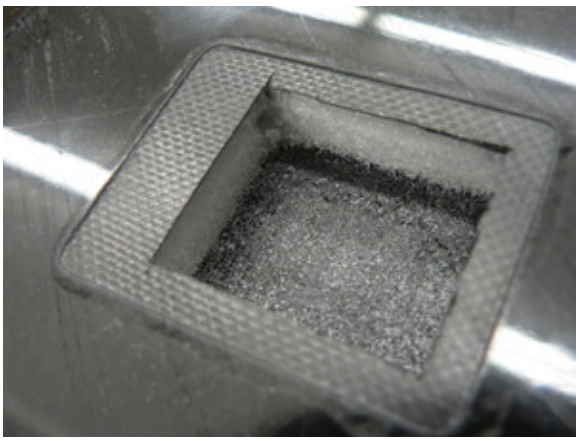
Servo locations have the skin indented for covers. Your kit may have the servo wells already made at the factory. If so, you can skip a few steps.

Start by cutting out the skin inside the servo locations.

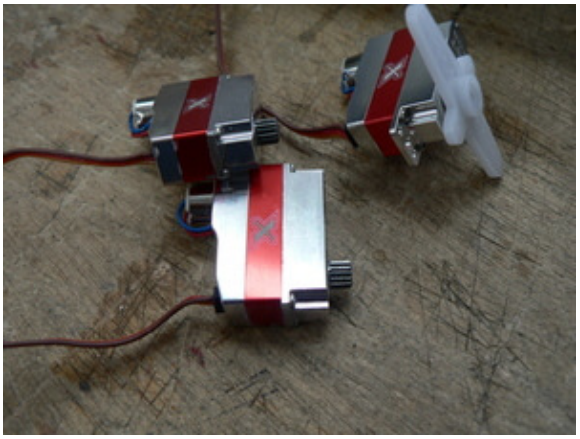


Peel off the skin carefully. The cuts should be at least 3mm inside the outline. More if your servo is smaller and you want to reduce the size of the servo pocket.

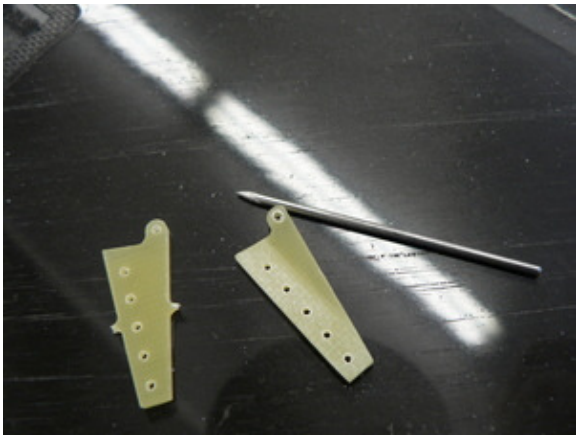
Pick out the foam inside the servo pockets carefully, first with a regular X-acto knife, then using a spade knife when near the top skin.



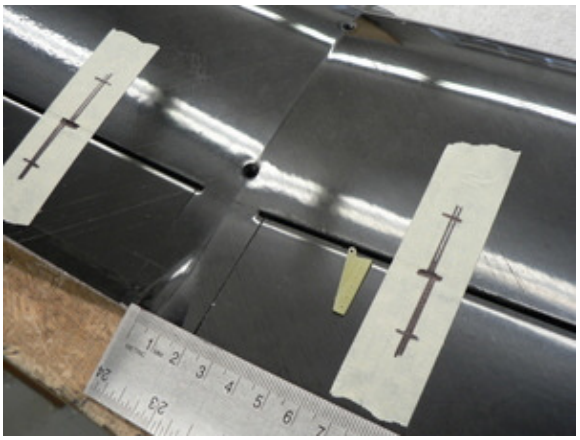
Clean the foam out completely, carefully scraping it off the top skin with the spade knife. You need as much depth for the servos as possible. You should see the wire channels in the corners of the pockets now.



If your servos have mounting lugs, you may want to remove them, depending on how you plan to attach the servos inside the pockets.



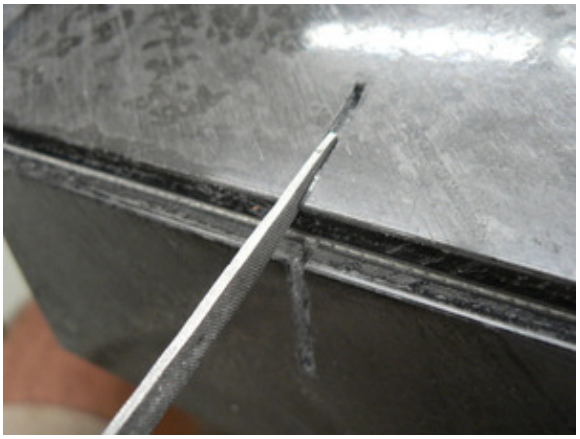
Prepare the aileron control horns by re-drilling the hole with a sharpened piece of the 1.5mm pushrod wire supplied with the kit. If desired, you can use a smaller size wire for aileron pushrods (easier to bend); 1.2mm wire is sufficiently strong for the job, but 1.5mm is stiffer (stiffness helps to reduce your chances of aileron flutter).



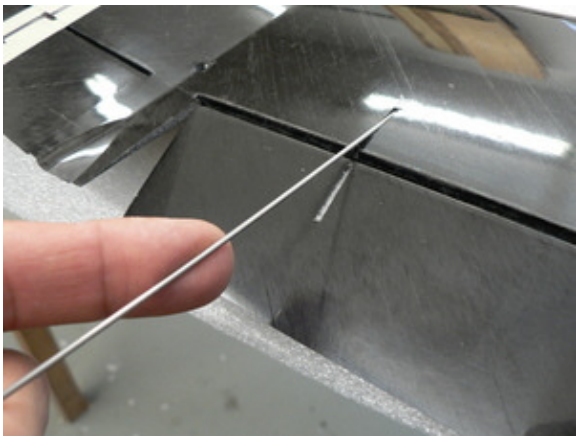
Use masking tape, and mark the locations of the cuts for the aileron pushrod exits and the control horns. The exit slots must be located near the outside edge of the servo pockets. Measure the distance on the bottom of the wings, then transfer the mark to the top. The control horns must be slightly offset to the outside, to allow for the pushrod wire bend radius.

Carefully cut the skin along the marked lines. The exit slots must be about 20mm long.

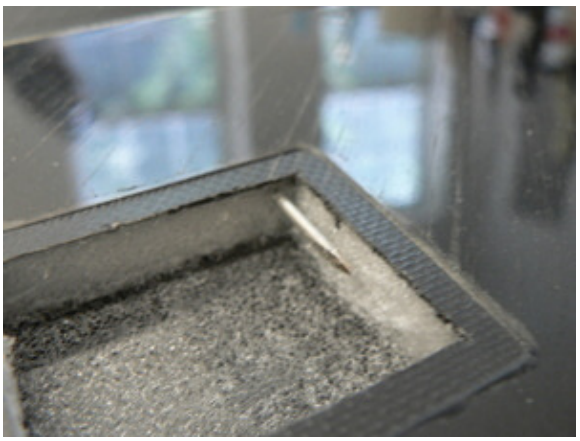
When the skin is cut, pick the foam out of the slots using an X-acto knife and/or the tip of a needle file.



The vertical wall must be removed completely on the aileron side and about 1/2 way down on the wing side.

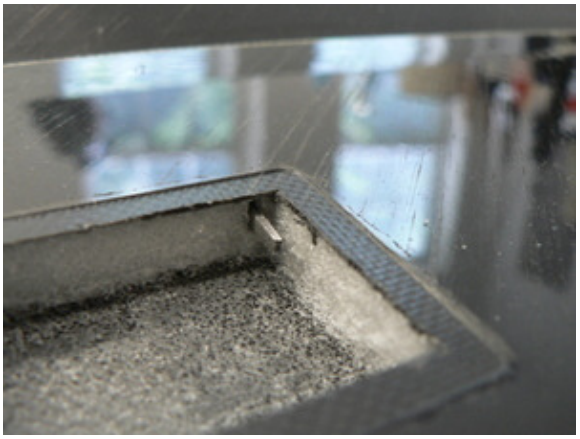


Use a sharpened wire to make a guide hole for the pushrod channel.



The wire ideally must exit near the outer edge of the servo pocket, close to the bottom skin.

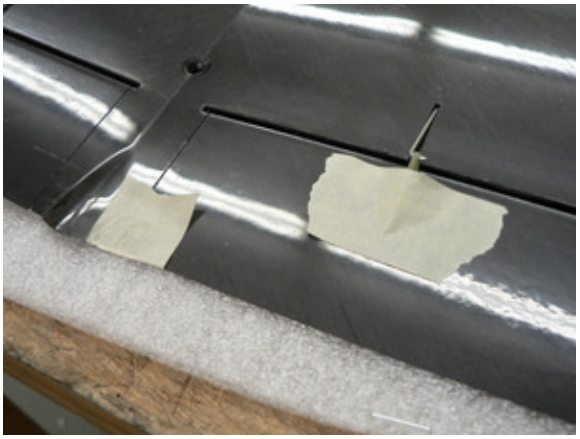
Use a rectangular needle file to make the pushrod channel by expanding the guide hole. The channel must be elongated vertically to provide space for the pushrod travel up+down during the aileron deflections.



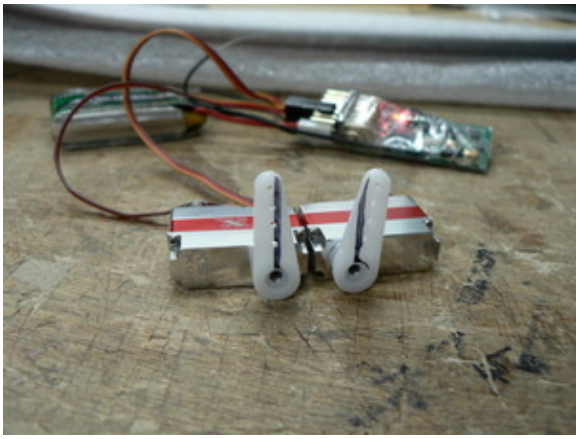
The needle file inside the servo pocket. You can reverse the direction and expand the channel from the pocket side also.

Trial fit the control horn in the slot. Do not glue at this time.

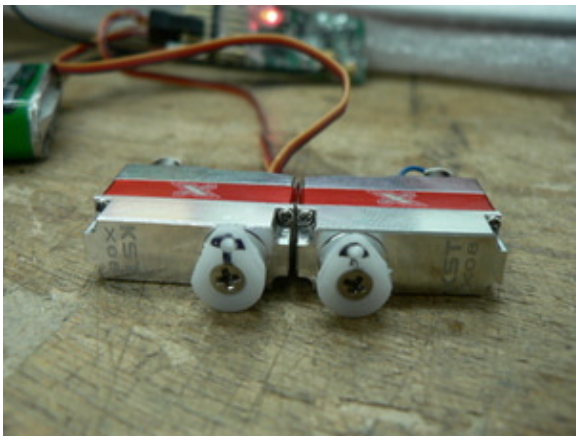
Sharpen slightly the end of one pushrod wire. Then make a sharp bend about 3mm from the end.



Tape the aileron ends to the wing root tabs to keep them at zero deflection. Insert the long end of the pushrod wire into the channel. Install the control horn into the slot and temporarily tape it down.



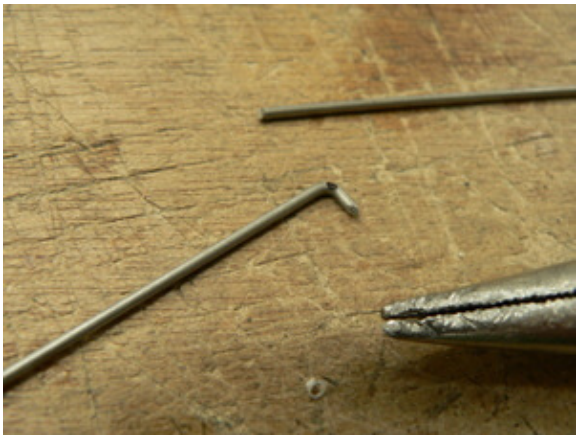
Prepare the servos and servo arms. Set the servos to the neutral position. Attach two servo arms as close to 90 degrees as possible. Draw a line on each arm at exactly 90 degrees. Mark locations of the new holes, about 4.5-5.0 mm from the axis.



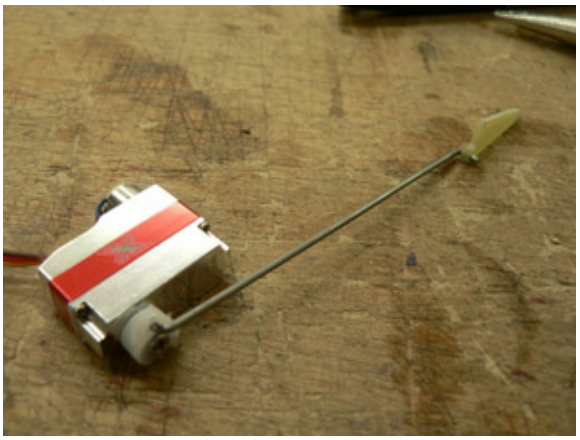
Drill new holes in the servo arms. Cut off all excess material around the holes to make two nice looking very short servo arms. The objective is to hide the entire servo and its arm under the cover.

Important! Electronically deflect both servos equally about 20-25 degrees towards the leading edge. This will be the neutral point for the ailerons. This will provide more down travel for the ailerons (when used for landing). Drop the servos into the pockets and center them between the fore/aft walls of the pockets. Mark the location of the bend on the pushrod wire.

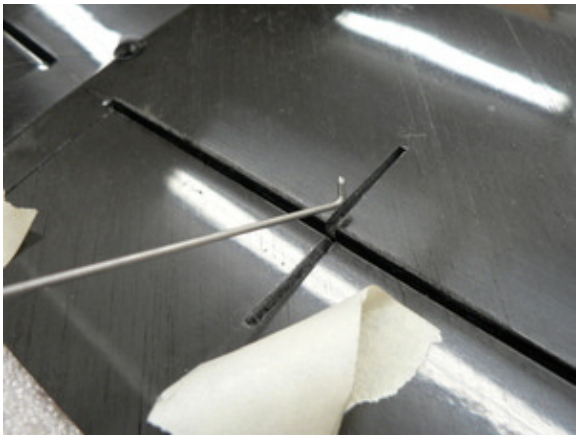
Remove the pushrod wire and the control horn from the wing. Cut the wire about 3 mm past the mark. Sharpen the end of the wire slightly. It is much easier to do this BEFORE bending the end.



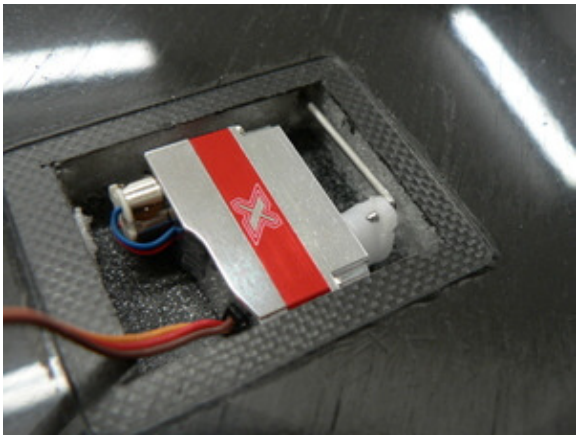
Bend the pushrod end at the mark.



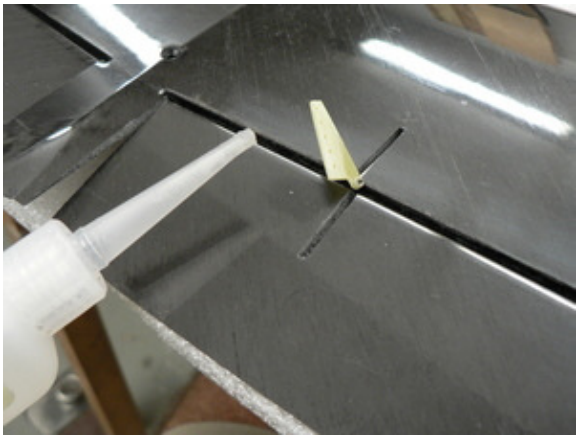
Insert the pushrod into the servo arm. Verify that the servo and control horn are square to each other, otherwise the servo will be forced to angle slightly when inside the pocket. Correct the pushrod if needed.



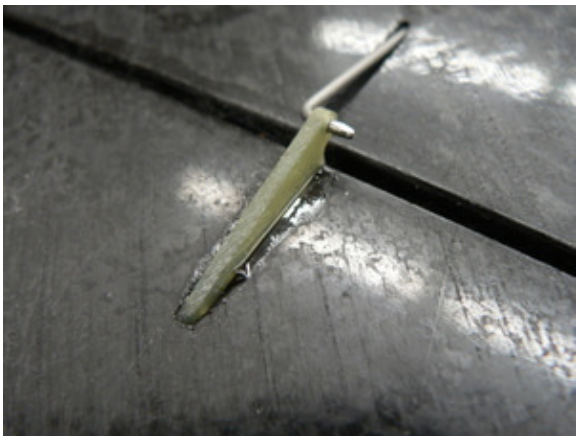
Insert the aft end of the pushrod through the channel carefully. The 3 mm bend should fit inside the vertically elongated channel. Install the control horn into the slot again temporarily.



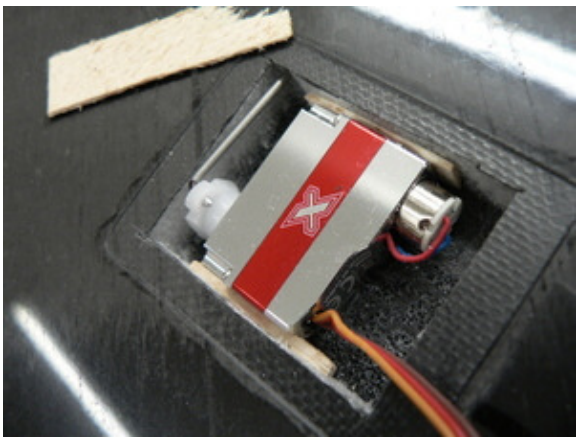
Drop the servo into the pocket again. Insert the pushrod into the arm. Verify that the servo is sitting flat and has some space at both fore/aft walls of the pocket. Temporarily tape the servos into the pocket to prevent them falling out during the next step.



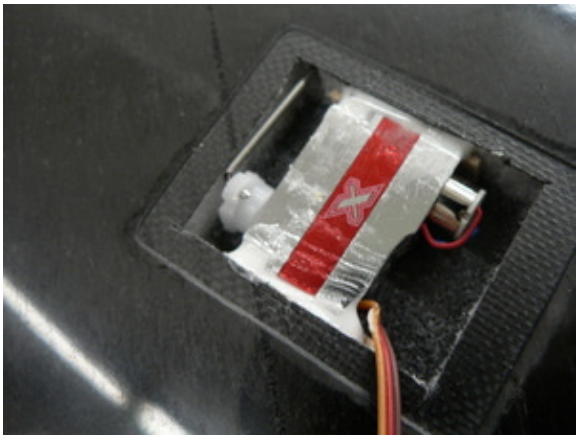
Lift the control horn off the slot. Apply medium CA or epoxy into the slot.



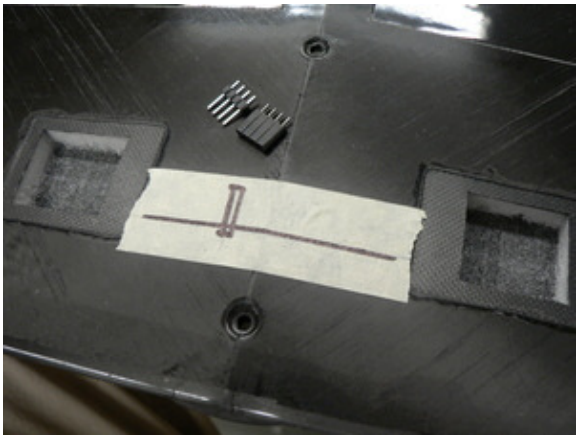
Install the control horn permanently now. Remove excess glue if needed. Try to avoid getting glue onto the hinge line!



Important! Keep the servo arms in their exact offset position by plugging the servos into the receiver with a battery, and keep the ailerons taped to the wing roots. Make balsa shims that will go on both sides of the servo and wedge the servo inside the pocket slightly. Do not use excessive force or the top wing skin will warp at the pocket and you will have a visible bad spot there, both visually and aerodynamically.



Apply some 5-min epoxy and microballoons mix to the corners between the servo and the pocket walls. Try to avoid getting epoxy onto the top skin, or it may warp the top skin when epoxy shrinks a little. Also, removing servos (if needed for repair) will be problematic.

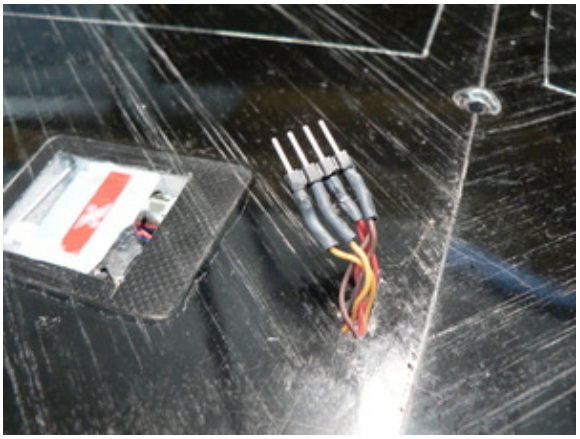


A connector for the wing is optional, but it helps greatly if you are planning to disassemble the model for transportation frequently as most people do. A simple option for the wing connector is to use a 4 pin section of a circuit board pin strip. Mark the location of the servo wire channel and the connector on a piece of a masking tape. The recommended position for the connector is near the side of the fuselage, to leave the space in the middle for ballast and control lines.

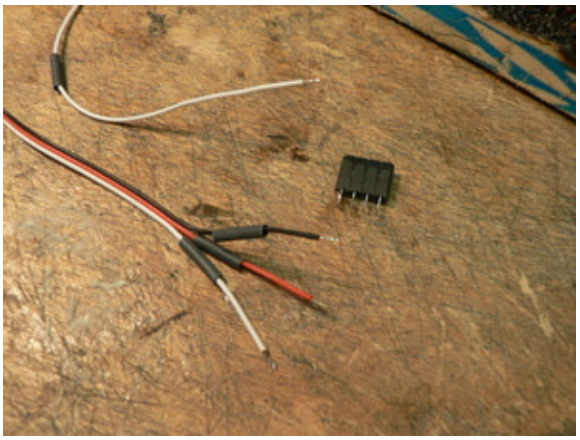
The line shows the approximate location of the wire channels and is drawn by connecting the corners of the servo pockets, where the wire channels are visible. The connector slot must be located on or near the wire channel. Make a slot in the wing for one part of the connector. Verify that the servo wire channels open up into the slot and are clear of glue.

Transfer the location onto the fuselage.

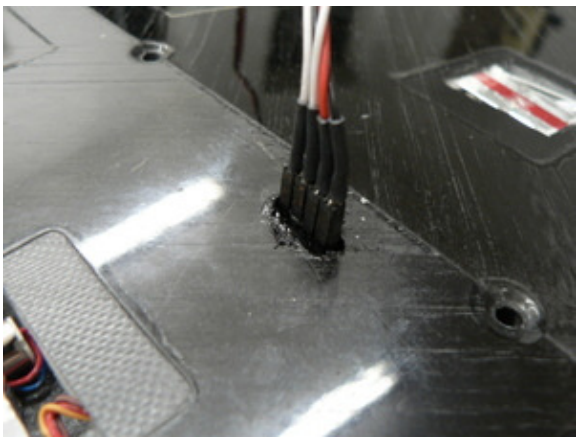
Make a rectangular hole in the fuselage. Allow for some freedom of movement around the connector. The two connector parts must mate exactly and the fuselage part will be exactly positioned by the wing in a later step.



Solder the male connector part to the servo wires (after the servo installation is done).



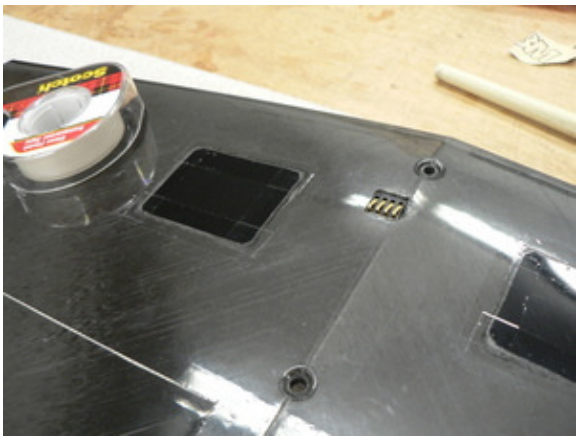
Prepare the wire harness that will go inside the fuselage.



Glue the wing part of the connector inside the wing, either flush or slightly below the wing surface. Use the mating part of the connector for keeping the pins vertically. After the epoxy cures, clean the excess epoxy around the base of the connector.

The wing connector part is done. Apply some wax to the connector pins and the area around the base of the connector. Now plug the mating connector with the wire harness onto it again. Thread the harness wires through the rectangular hole in the fuselage. Apply some thickened 5-min epoxy to the mating connector and the area inside the fuselage where the connector is near the side wall. Carefully attach the wing to the fuselage and wait for the epoxy to harden. The fuselage connector part must be glued to the fuselage side wall.

After the epoxy cures fully, detach the wing and clean any excess epoxy around the fuselage connector.



Now you can close the servos with the supplied servo covers. Round their corners and trim edges if needed to fit within the recessed areas. Use clear Scotch tape to attach the covers.

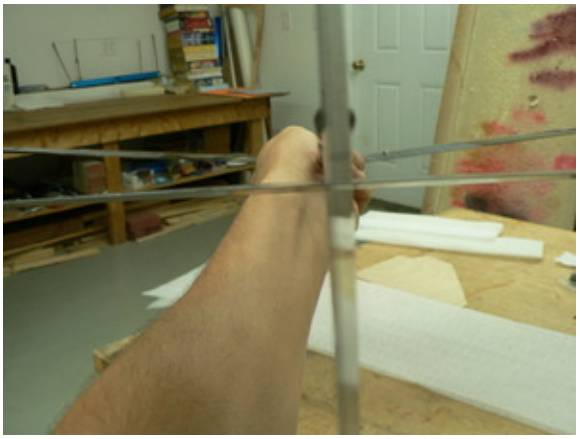
Mark the location of the horizontal stab mount on the tail boom. About 35mm of the boom tip will be inserted into the vertical tail socket. So the horizontal tail must be located about 40-45mm from the end of the tail boom, to provide 5-10mm clearance between he two tail surfaces. Clean and roughen the surface of the tail boom in places where the vertical tail and the horizontal tail mount will be attached. The horizontal tail can be attached either below or above the boom, aerodynamically it makes little or no difference.

Place the assembled fuselage and wing on a table, to establish the horizontal position of the wing.

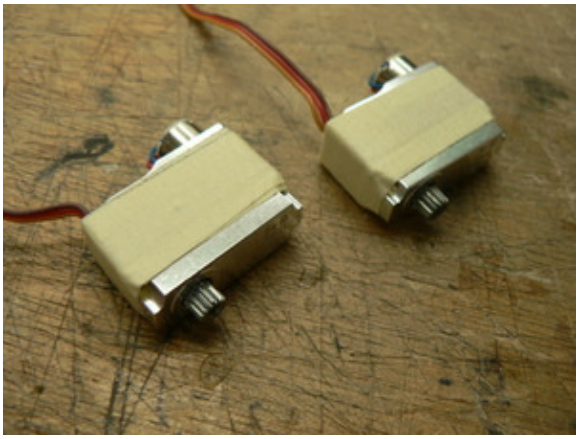
Place two identical blocks on the table to help with positioning the horizontal tail parallel to the table surface. Use initially a small drop of medium CA to attach the tail mount to the boom. Sight down the tail and check wing and tail alignment. If not square, break off the tail mount and start over.

If the tail was square to the wing, detach the horizontal tail from the mount; then apply medium CA around the entire tail mount and press it down until the CA kicks off. Doing this with the tail attached may lead to CA wicking into the screw holes and gluing the plastic screws and the tail itself permanently to the tail mount.

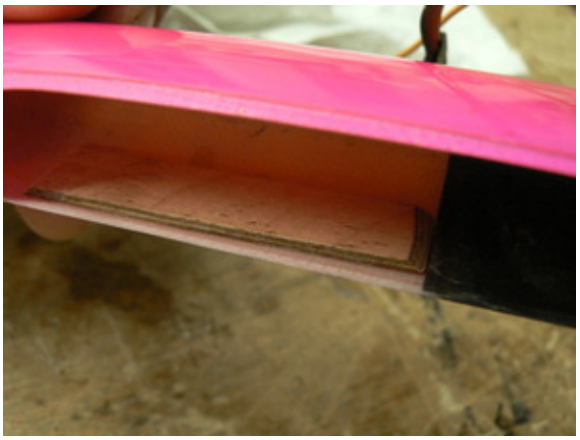
For attaching the vertical tail, use either a very slow CA or 5-min epoxy. You need a few seconds for positioning the vertical tail on the boom square to the horizontal tail and the wing. A fast CA will not work well in this case. If the fit between the tail boom end and the socket is too loose, you can wrap a few wraps of cotton thread onto the tail boom end. This will help with positioning the vertical tail on the boom, while allowing for the glue to penetrate into the joint.



Sight down the tail boom to verify and correct the squareness of the vertical tail before the glue sets.

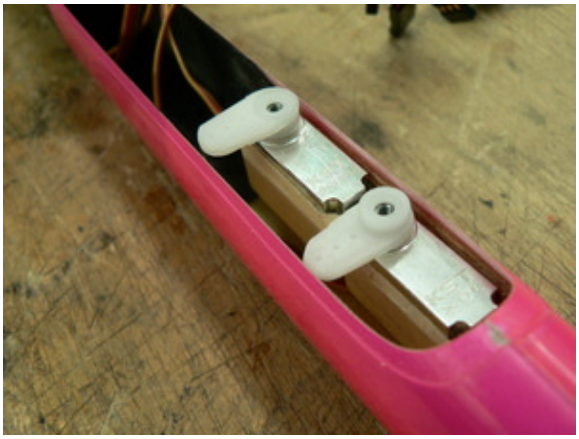


The easiest way to mount the fuselage servos is to glue them to the fuselage sidewall. In case you need to remove the servos later (for repair), wrap them in masking tape. This way the tape can be cut later and unwrapped off the servo, and the servo popped out.

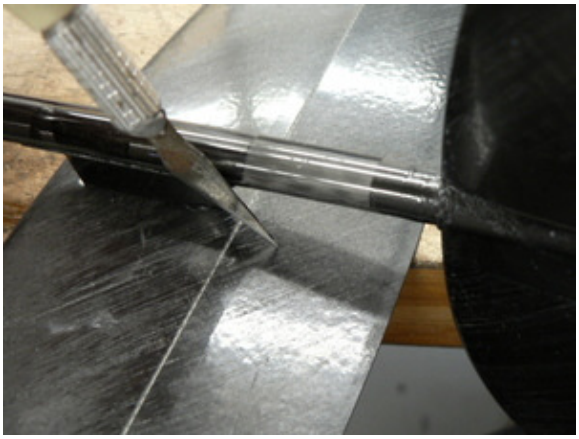


You can use an optional plywood base glued to the fuselage sidewall, for protecting the fuselage in case of future servo removal. This also provides a flat surface for gluing the servos.

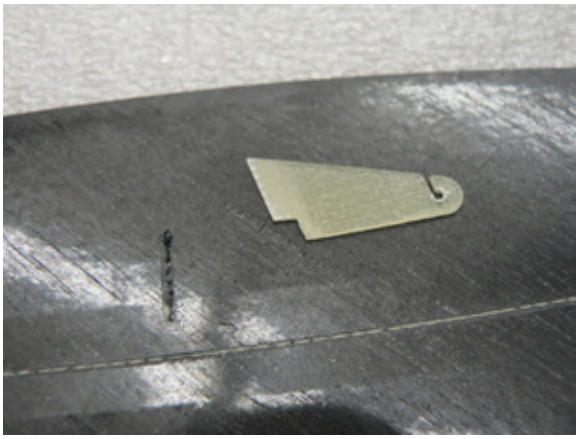
Servos are glued to the plywood base with medium CA or 5-min epoxy.



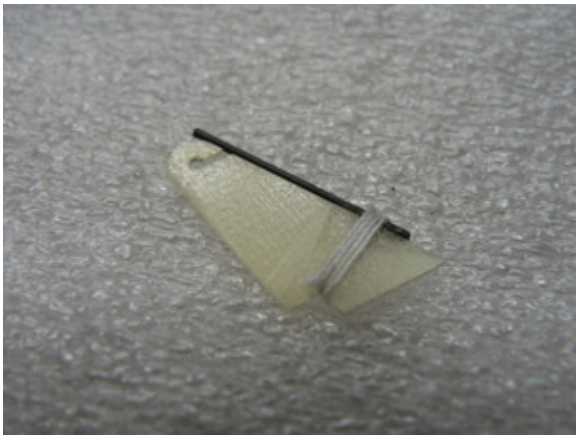
To eliminate interference of the control cables, either offset the servos a little or use two servo arms with upper and lower offset. Trim the servo arms to a shorter length if needed.



Install the horizontal tail, mark and cut a slot for the elevator control horn near the tailboom.

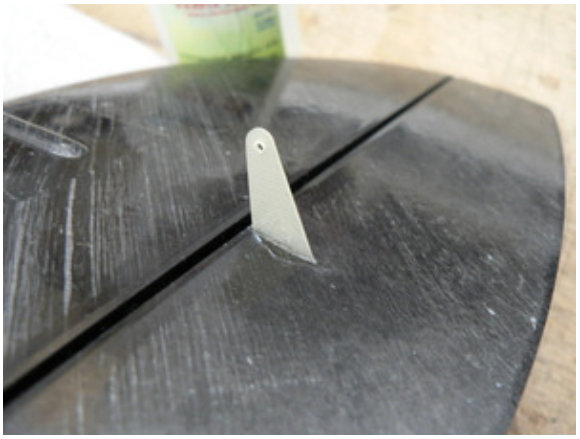


Trim the elevator control horn down to about 17-19mm from the base to the hole. Make a slit on the rear side for inserting the cable.

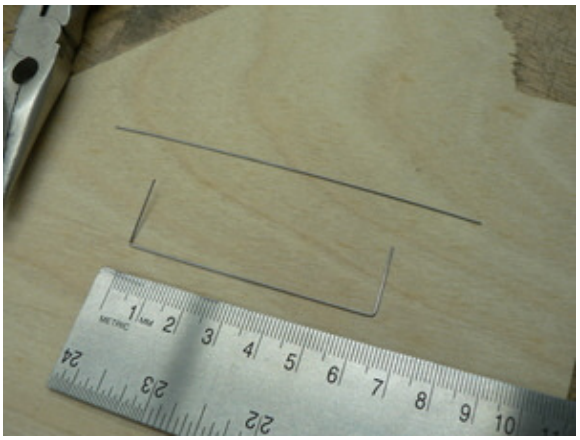


Strongly recommended: make a keeper (lock) for the control cable that will prevent it from falling off the control horn during accidental hard bumps on landings. A tiny carbon rod and some cotton thread work very well for this.

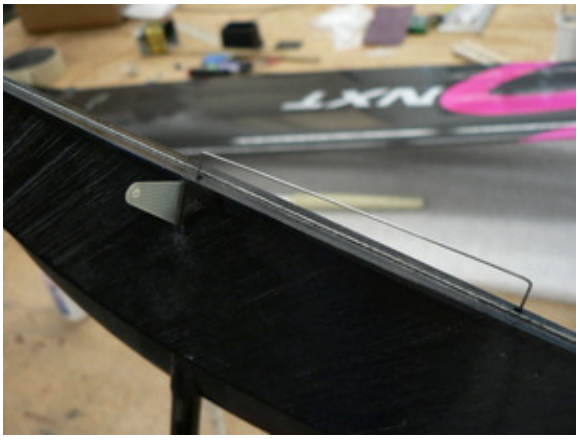
Elevator control horn installed with CA.



Rudder control horn installed similarly. No slit is necessary since the control cable will be attached permanently.



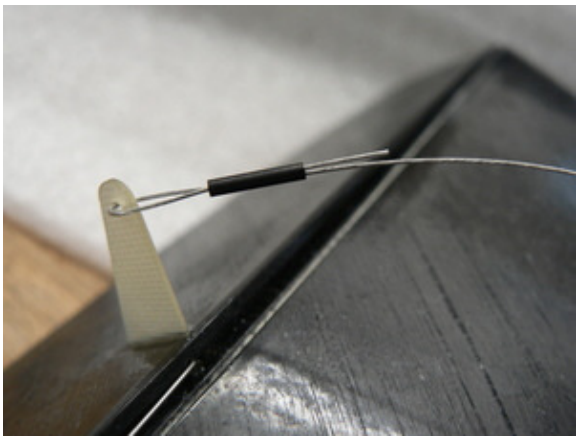
Make two torsion springs for the rudder and the elevator from the supplied 0.5mm spring wire.



Make two holes, one in the rudder near the control horn, one in the main part of the vertical tail, using either a micro drill bit or a sharpened piece of slightly thicker wire. Insert the U-spring into the holes. Apply a tiny drop of CA to each hole to reinforce the foam and lock the spring in place.

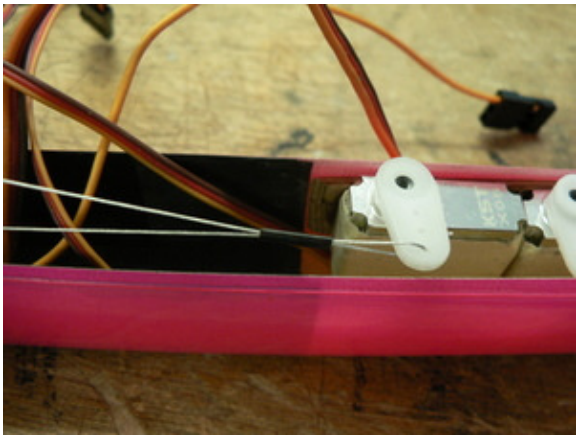
Repeat the same procedure on the elevator.

Make slits in the tail boom for cable exits. One for the rudder cable, behind the stab mount, and one for the elevator cable on the opposite side, in front of the stab mount.

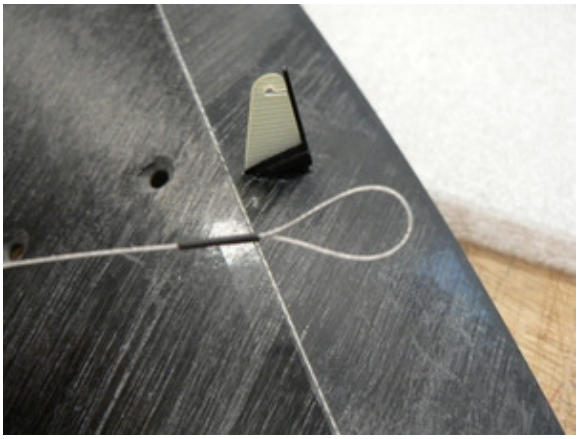


Insert the rudder cable into the slit and run it all the way to the front. Insert the rear end of the cable into the rudder control horn, make a loop, and crimp the cable with a small piece of copper or steel tube. Squeeze the tube with pliers to create a permanent crimp.

Fix the rudder in neutral position with masking tape.

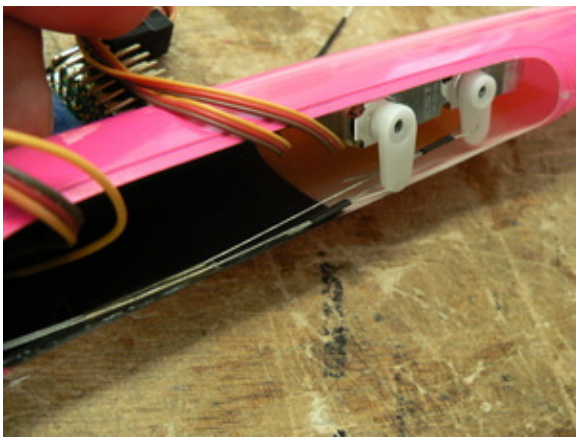


Stretch the cable tightly to remove all slack and crimp it to the servo arm similarly. There is no adjustment possible once you crimp it, so make sure the rudder and servo are both in neutral position and the cable is taut.

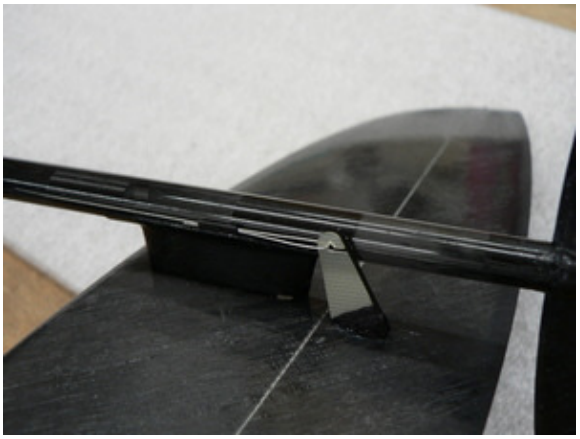


For the elevator cable, make the rear end loop first. Attach the horizontal tail to the fuselage, fix the elevator in neutral position, run the cable to the servo.

Crimp the front end of the cable to the servo arm. Here you may want to use a smaller length of the servo arm (middle hole) since the required elevator deflection is normally smaller than the rudder deflection and a smaller servo arm is needed. You may want to verify the achieved elevator deflection before crimping the cable permanently.

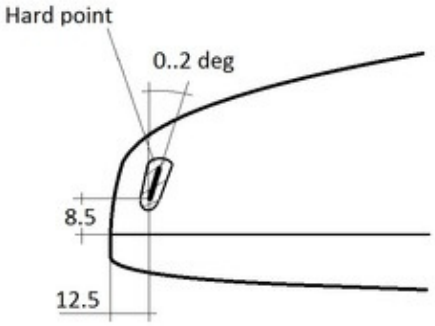


Both cables in place. Optional guide tubes can be used to keep the cables near the upper fuselage wall. The tubes of course must be threaded onto the cables before crimping them to the servo arms.



The rear end of the elevator cable in the working position.

The rear end of the rudder cable in the working position.



This sketch shows the factory recommended location of the launch blade on the wing tip. On the left wing tip there is a hard point made of epoxy and microballoons located as shown on the sketch. To install the blade within this hard point, it must be located about 12.5mm from the tip and about 8.5mm forward of the hinge line. Depending on how your fingers are gripping the blade, this may or may not be a convenient location for you. If you do not want to use the recommended location for the blade, and have to install it outside of the hard point, you may want to use extra reinforcement patches as shown on the next picture.

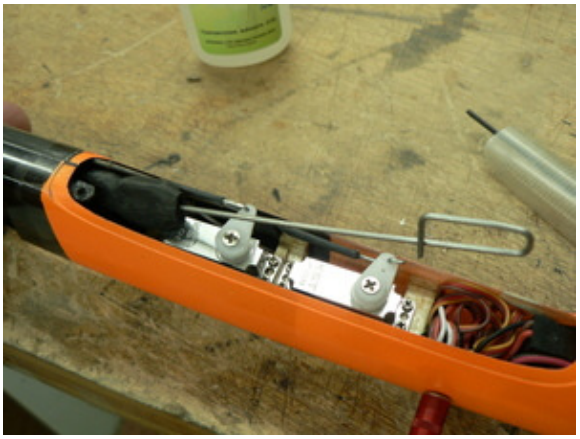
To install the launch blade, make an elongated hole at the desired location. Check the shape of the hole with the actual launch blade to assure a reasonably tight fit. If you are a very strong launcher and/or you chose to install the blade outside of the factory hard point, a reinforcement around the blade is recommended. On the picture, a single layer carbon reinforcement is shown.

Glue the optional reinforcement patches either with CA or epoxy. Re-open the holes if needed.

Insert the blade and glue it with medium CA or (better) bonding epoxy glue.

If you plan to fly in very windy conditions in competition, you will need to use ballast. Here you see a small bracket made of plywood and/or carbon plate, glued under the rear edge of the canopy opening. This will be used for hooking up ballast skewers to it.

Ballast skewers of different weights are made with 1.2mm wire and small fishing weights, smashed and covered with shrink wrap tubing. The forward end of the skewers has a paper clip like loop for engaging into the bracket on the fuselage.



Insert the ballast skewer into the fuselage. The servos must be installed such that there is enough space behind them for inserting the ballast.

Engage the wire hook into the bracket. The ballast is fixed from moving fore/aft. It will rattle inside the fuselage slightly during flights, but that is OK.

Assembly finished. Install your receiver and battery in the nose. Use some nose weight if needed to achieve the desired CG (65-70mm range is recommended). Program your radio and enjoy flying your Stream NXT.