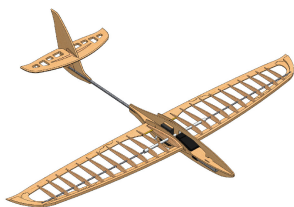


Z²²



SP & EP Construction

Thank you for purchasing the Z22 by Zaerotech. The Z22 series aircraft are intended for light to moderate air for slope conditions, and thermal work

I've put a special effort into making this kit technically satisfying for the intermediate to advanced builder. Tolerances are tight, considering the material and its thickness variations. So take your time, dry fit everything first, don't overdue the adhesive, but most of all, have fun

Always check the Z22 product page at www.zaerotech.com for the latest construction manual. It updates about once a month, and is a must, to ensure you have up-to-date information

Construction Guidelines

Removing Parts; The parts have been designed to break-out easily with your fingers. Carefully stress the separator tabs to remove. If in doubt, use a modelling knife to help

Adhesives: Although construction time is dramatically reduced using Cyano adhesives, Thirty-minute epoxy or Aliphatic resins like TiteBond, work equally well. The Aliphatic represent the easiest sanding option, but require more time. Epoxy is the best option, as it can be thinned and brushed onto the entire structure to strengthen the overall design, and seal the wood. If flying moderate slope conditions as a rule, the epoxy option will bring the loading up enough to increase penetration. Five-minute epoxies are not recommended

Covering: Use a light covering, as normal weight material will over-stress the structure, and could damage it. Use an iron with a sock to shrink the material, rather than a heat-gun

Electronics: Both the SP & EP Z22's aircraft are designed for 1S Lipo voltage. If you purchased the Stage 2 kit, the servo's operate at a maximum of 4 volts. Nominal 3.5 volts. Both aircraft will accommodate a standard 150ma 1S lipo

Fastening components: Use small Velcro straps to secure the Battery and Rx. Fix the servo's in-place with silicone adhesive, a drop of Aliphatic resin at several points, or other nonpermanent means

Enjoy the build

Kevin J. McDonald

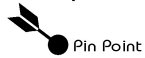
A handwritten signature in black ink, appearing to read 'Kevin J. McDonald', is written over the printed name.

Zaerotech.com

Step 1 - Lightly Sand all wood parts with 320 grit sandpaper. Make sure the separation tab material is removed, so that parts will mate properly. Do not overdue it, as the parts are designed to fit by simply sanding off the laser residue

Step 2 - Deburr all metal parts, removing ridges and sharp edges. Test fit all metal parts before bonding, and make sure they are clean and dry. Sand the ends of the carbon parts to produce a small chamfer. This will help them slip through their respective capture points

Step 3 - Arrange the plywood parts on this plan for the Left Wing. Use the other plan for the Right Wing. Fit Rib R1 to reference the root distance perfectly. Pin only at the indicated points, and use as fine a pins as possible to avoid splitting the plywood. Pin the outside edge near the joints to close any gaps that might appear

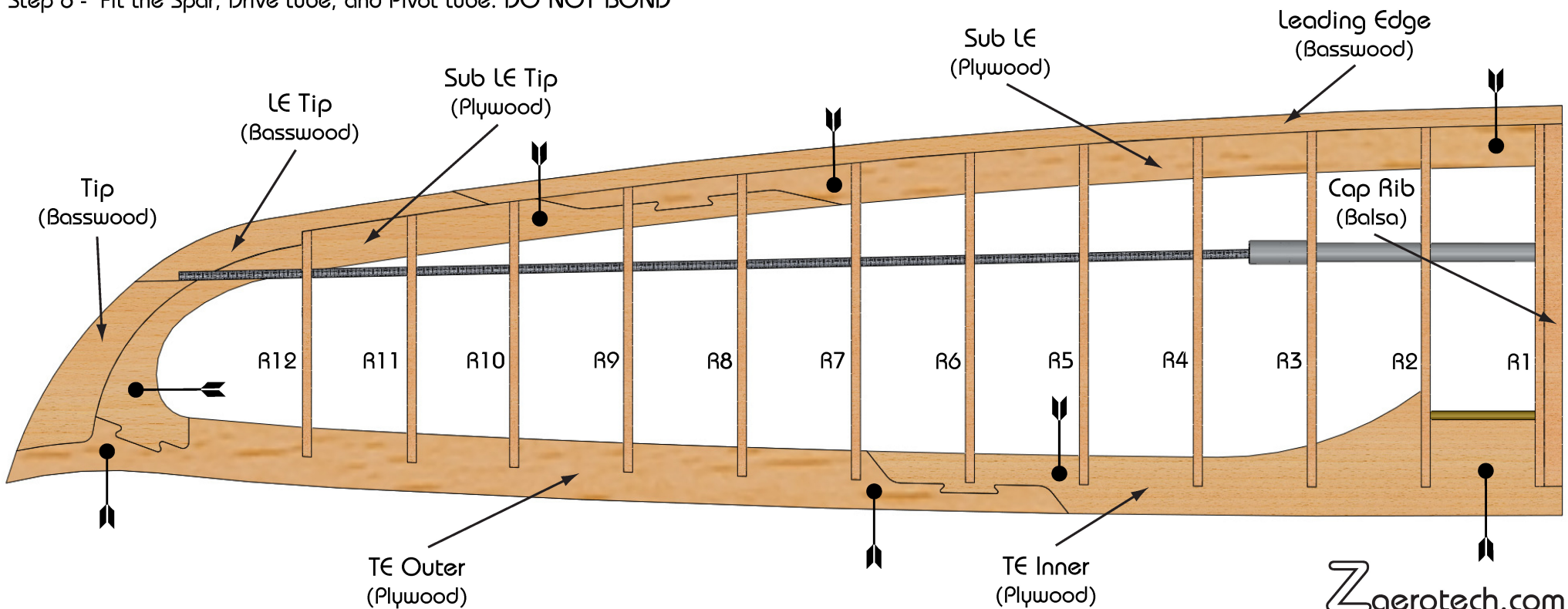


Pin Point

Step 4 - Bond R1 in place using the Multi-Tool to insure it installs at 90 degrees to the work surface. Dab & press adhesive into the joints, and let cure

Step 5 - Fit and bond the remaining Ribs, making sure the adhesive forms an adequate fillet at all points of contact

Step 6 - Fit the Spar, Drive tube, and Pivot tube. DO NOT BOND



Step 7 - Slide the carbon Spar far enough away from the aluminum Pivot tube, to allow the aluminum Coupler to slip onto the Pivot tube // Insert the magnet (orientation does not matter) into the coupler, and slide the Spar back against it as illustrated in the detail.

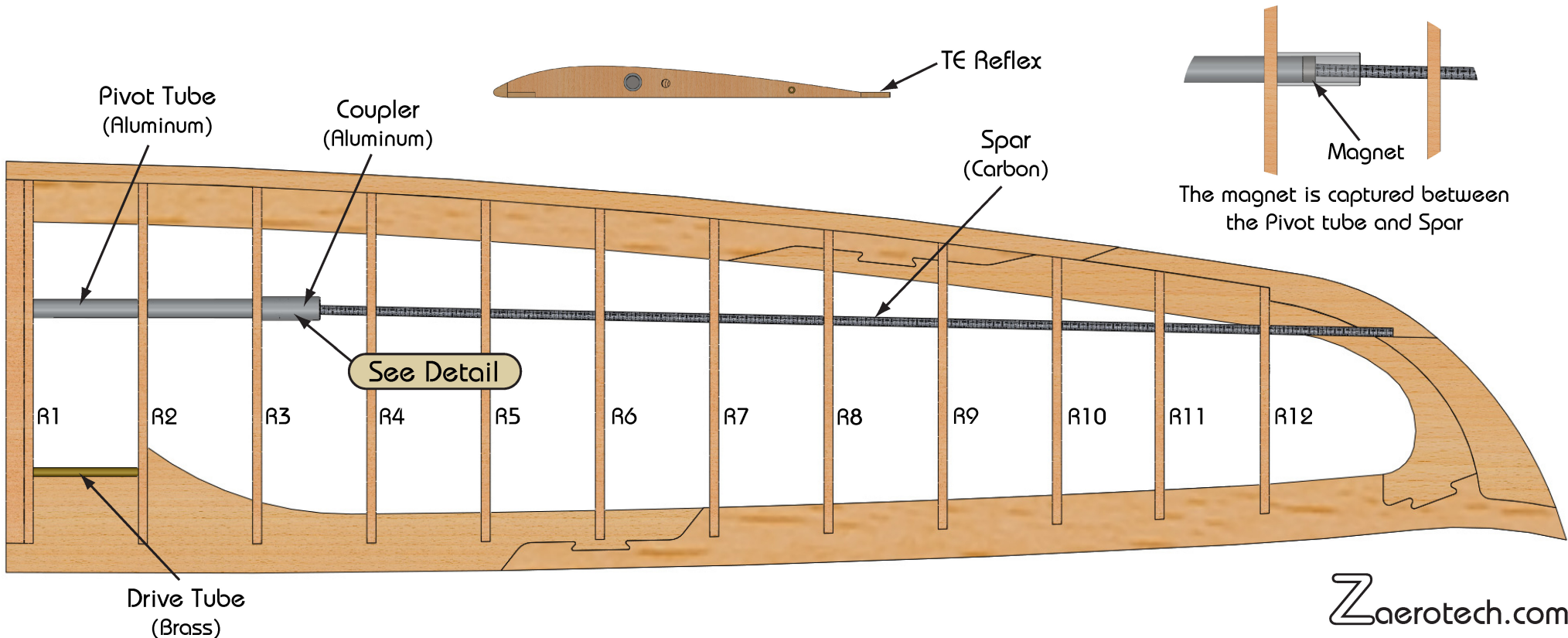
Step 8 - Fit and bond the basswood Tip. DO NOT USE PINS on any basswood parts // Fit and bond the basswood LE Tip. The Spar should butt to the indexed stop in the LE Tip. The Pivot tube will protrude slightly past R1.

Step 9 - fit and bond the basswood LE and balsa Rib Cap.

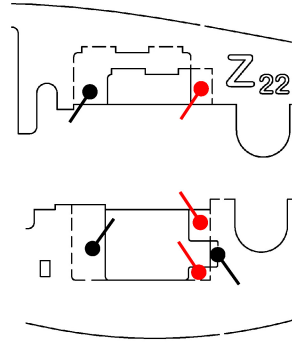
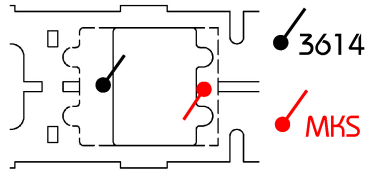
Step 10 - Bond all points of contact between the Spar and Ribs, and form adhesive fillets where the basswood parts join the ply parts.

Step 11 - Bond all points of contact on the Pivot and Drive tubes. Be careful not to wick adhesive into the end of the Drive tube where it contacts the TE Inner ply part // Stand the wing on end, and apply a few drops of epoxy or Aliphatic resin into the Coupler to lock in the Spar. DO NOT USE THIN ADHESIVE as it may wick past the Magnet and into the Pivot tube

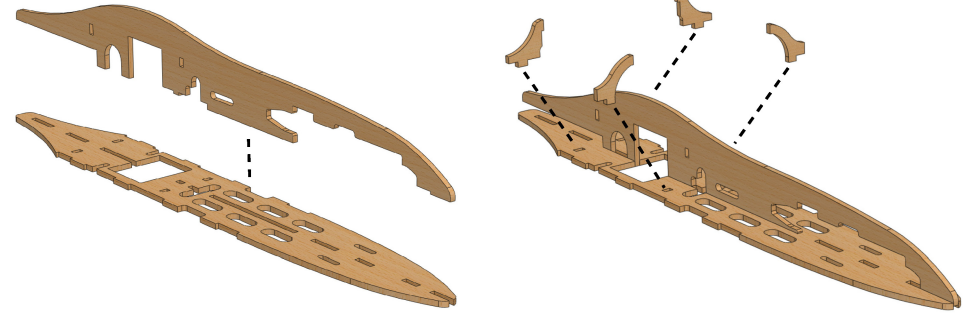
Step 12 - Sand the LE as indicated below, and use a fine grit sanding block to carefully sand the ribs until the laser residue is removed. Sand only until the ribs are dark brown, rather than showing fresh wood // Sand the TE to suit, but allow it to form the small reflex inherent in the section as shown.



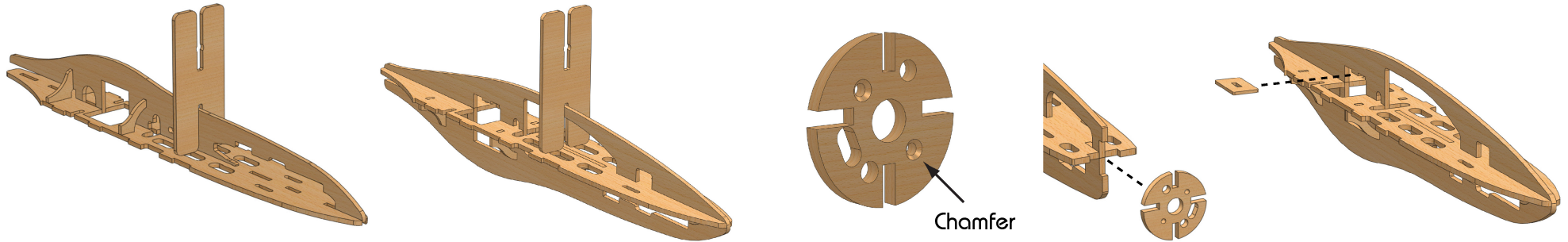
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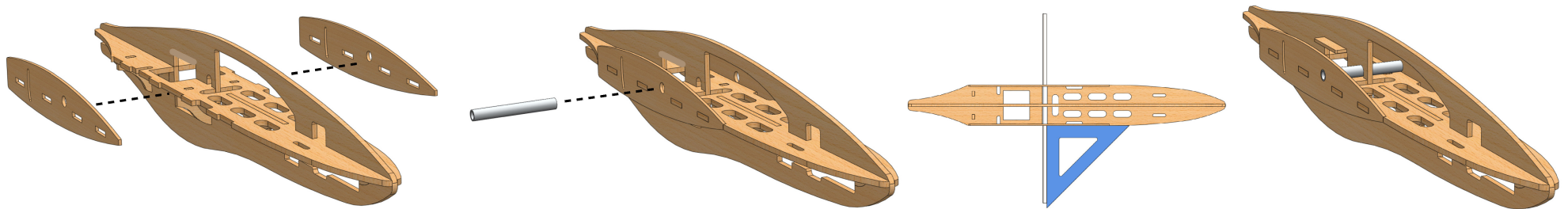
Fuselage Detail



Step 13 - Carefully remove the indicated material for your servo type. Use a hobby knife to score the tabs before removal, and be careful not to crack the Horizontal Spine when using the MKS servo. Press adhesive into the remaining gaps // With the Horizontal Spine on a flat surface, fit the Bottom Vertical Spine // fit the Struts by angling them in, bottom tabs first, then rotating them to the holes in the Vertical Spine

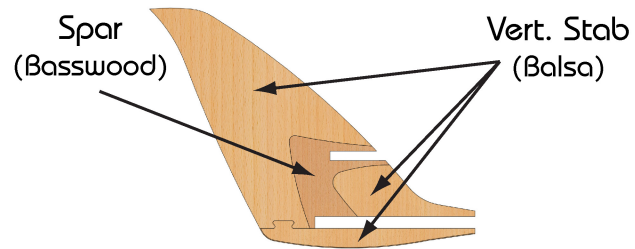
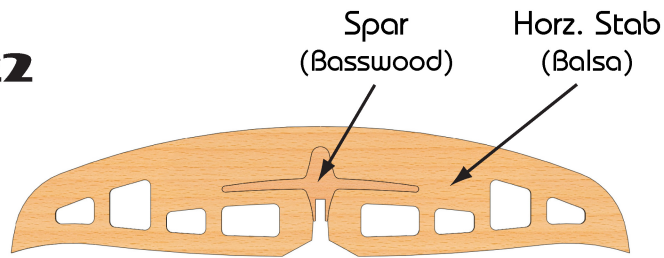


Step 14 - Square up the Spine with the Multi-Tool, and tack all points of contact // Turn over the assembly, and fit the Top Vertical Spine. Tack in place // For the EP version, if you received the small 2mm motor screws, chamfer the holes in the back side of the plate, and test fit the motor. Chamfer until you can engage a few threads. Then remove the motor and apply a drop of thin Cyano to the holes. Fit and tack the Motor Plate. Note the orientation, with the outrunner wire through-hole in the lower right position as viewed from the front // Fit and tack the Servo Plate in place, squaring it up



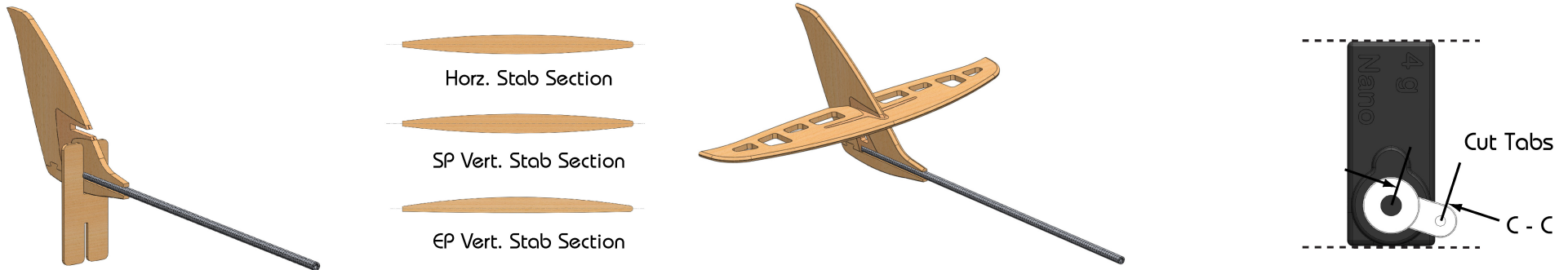
Step 15 - Fit the Drive Plates. Make sure they are flush and square before tacking in place // Fit the Fuselage Pivot tube // Check that the Pivot Tube is square to the Drive Plates before tacking // Check the entire assembly for proper alignment. Once satisfied, finish bond all points of contact.

Z²²

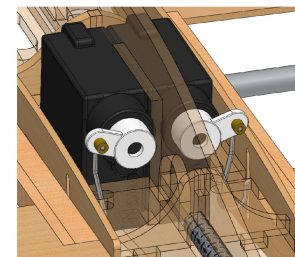
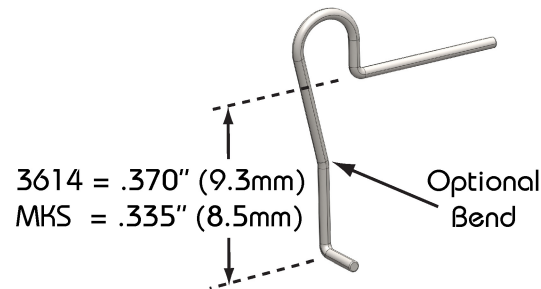
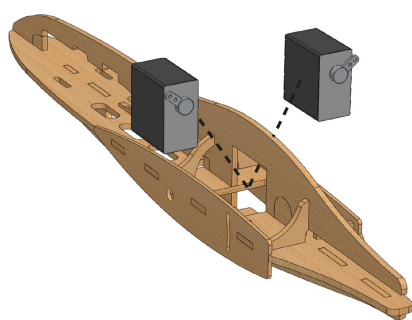


Final Assembly Detail

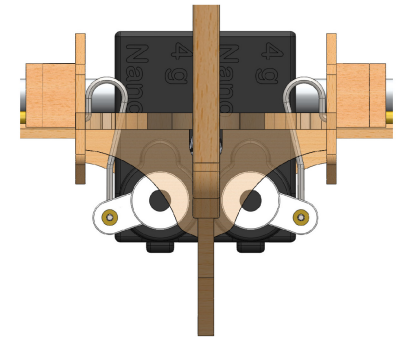
Step 16 - Fit the Spar into the Horizontal Stab, and press adhesive into the gap // Position the balsa Vertical Stab parts around the basswood Vertical Spar. Pin the perimeter, and press adhesive into the gaps // Sand the parts on a sheet of 320 grit on a flat surface to flush the basswood to balsa



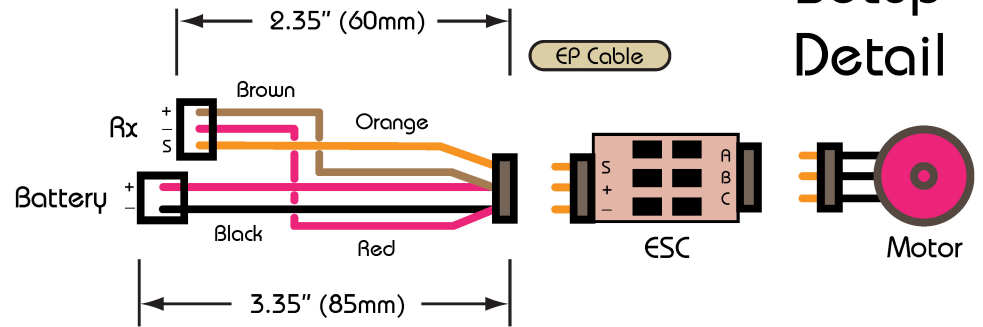
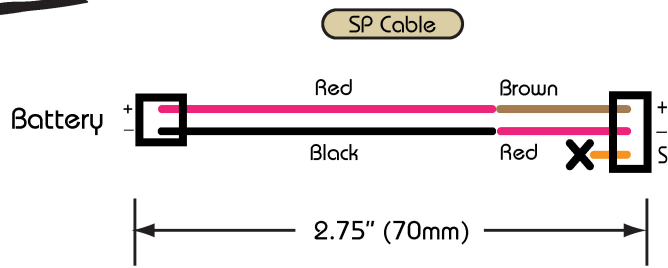
Step 17 - Use the Multi-tool to center the carbon Tail Boom. Slide the tool forward and aft, while tacking the Tail Boom tube in place // Test fit the Horz. Stab to the Vert. Stab. The fit should be a little loose, with the covering material taking up the gap to produce a snug fit // Sand both the Horz. & Vert. Stab as illustrated. Note the asymmetric Vert. Stab of the EP. Flatter side on the right // Cover both with light material to prevent damage to the structure // Cut both tabs off of the servos, and sand or file the ends flush. Connect and center the servos. Mount the servo arms as illustrated, with a center-to-center distance of between .195" (5mm) & .235" (6mm). You will remove the arms later, so don't torque the screws



3614 shown with brass Stops facing aft (forward for MKS)



Step 18 - Fit the Servos by angling them into the open frames. Test fit them first, then use Silicone adhesive to bond them together, as well as to the frames. Aliphatic resin or hot glue will also work. Don't use excessive adhesive // Make a 90 degree bend as illustrated. Note the two servo types and their respective lengths. Make both left & right versions // Fit the wires, cutting the excess length after the bend, to allow it to protrude past the servo arm only 1/16th (1.5mm). Note the bend faces forward for the MKS, and aft for the 3614 // Cut a short 1/16th (1.5mm) long piece of brass tubing, by carefully rolling a hobby knife over it to scribe a line around the circumference. It will separate after a few rolls back and forth // Fit the tube over the end of the wire to form a stop, and use a small drop of aliphatic resin or thick Cyano on the end to bond the two together // If your servo travel allows a collision to occur between the Control wire and servo arm at the extreme down TE range, you can make an optional bend as illustrated



Setup Detail

Step 19 - Before building the cable, note that the Rx cable has the + & - reversed from the standard pinout of the AR6300 and some other Rx's // For the SP, simply cut the female connector off the Battery cable, and splice the remaining cable with the male battery connector to the Rx. Note polarity swap, Cut to the indicated length // For The EP, cut and connect cables as illustrated. Note polarity swap for the Rx cable. If the motor spins in reverse, simply unplug the motor connector and plug it back in 180 degrees from before



Step 20 - Fit the steel Pivot rod, making sure the ends are free of burrs, but not rounded off. Sand the wing Root down approx. 1/16th" (1.5mm) while alternately fitting the wing to make sure the Root is flush with the Drive plate. Repeat with the other wing. The Pivot rod should be close to contacting the magnets. Now alternately sand the Roots again until both wings make contact with the magnets. When finished, you should have a small bit of slop, approx. the width of a piece of paper on both sides. This slop will be taken up by the covering material. Finally, sand the LE & TE of the Root to approximate a curve, where the Pivot tube is the high-spot, and the LE & TE are the low-spots. This will keep the LE & TE from scrubbing the Drive plate and resisting rotation. When satisfied with the function, cover both wings with light covering // Install all electronics, and fit the Tail assembly into the fuselage capture. DO NOT BOND at this time // Assemble the Balance jig, and fit the wings. Set the model on the jig, and space the TE approx 1/4" (6mm) from the aft indicator. If you are tail-heavy, cut up to 1/4" (6mm) from the boom and refit until the model balances. If you need additional ballast, apply lead to the indicated area

Step 21 - Set your Tx for Elevon mixing, and adjust the differential to approx. 60%. Adjust the servo Travel to get as much throw as possible, without colliding the Control wire link with the Drive plate cutout. Check control movement. A left bank will need the left wings TE to travel up. Back-stick (up elevator) will need both TE's to travel down. Be careful to set travel to include full bank and full elevator at the same time, as the combination can over travel the mechanism and cause a collision // Experiment with CG balance and elevator trim to find the best performance. Elevator trim changes wing incidence and can have a profound effect on flight, so start with the wings TE pointing at the arrow on the jig, and adjust from there