

TWISTED HOBBYS



Twisted RACER SERIES

Mustang / Nemesis / Rare Bear

MOTOR: 1x 24g to 26g / 1450kV Outrunner
ESC: 1x 10 to 12amp
SERVOS: 2x 5g to 7g / 1x 9g
PROP: 8x4 DD Prop
BATTERY: 3s / 600-850mAh

RADIO: 4 channel
WINGSPAN: 31"
LENGTH: 28"
AUW: 230g (depends on equipment)

USA Distributor

Twisted Hobbys

www.twistedhobbys.com

TWISTED HOBBYS

West Milford, NJ 07480

Website: www.twistedhobbys.com – email: sales@twistedhobbys.com

Thank you for your purchase of this model from Twisted Hobbys'. Please read through the entire manual before beginning to build this model. If you have any questions please contact us at the above indicated email address.

WARNING INFORMATION

This R/C Aircraft is not a toy! Read and understand the entire manual before assembly. If misused, it can cause serious bodily harm and property damage. Fly only in open areas, and AMA (*Academy of Model Aeronautics*) approved flying sites. Do not overlook the warnings and instructions enclosed or those provided by other manufacturers' products. If you are not an experienced pilot and airplane modeler you must use the help of an experienced pilot or an authorized flight instructor for the building and flying of this model aircraft.

These instructions are suggestions only on how to assemble this model. There are other ways and methods to do so. Twisted Hobbys has no control over the final assembly, the materials and accessories used when assembling this kit, or the manner in which the assembled model, installed radio gear and electronic parts are used and maintained. Thus, no liability is assumed or accepted for any damage resulting from the use of the assembled model aircraft or from this instruction manual including but not limited to direct, indirect, incidental, special, and consequential damages. By the act of using this user-assembled product, the user accepts all resulting liability. In no event shall Twisted Hobbys' liability exceed the original purchase price of the kit.

SHIPPING DAMAGE

Twisted Hobbys checks each plane before shipping to ensure that each kit is in fine condition. We have no bearing on the condition of any component parts damaged by use, modification, or assembly of the model. Inspect the components of this kit upon receipt. If you find any parts damaged or missing, contact Twisted Hobbys immediately. We will not accept the return or replacement of parts on which assembly work has already begun. Twisted Hobbys reserves the right to change this warranty at anytime without notice.

OUR MISSION

To provide the best products and service to our customers at the lowest prices possible. We take great pride in our company, our commitment to customer service and in the products we sell. Our online store is designed to provide you with a safe and secure environment to browse our product catalog.

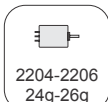
SAFETY NOTES

- Before assembling and flying this model, read carefully any instructions and warnings of other manufacturers for all the products you installed or used on your model, especially radio equipment and power source.
- Check thoroughly before every flight that the airplane's components are in good shape and functioning properly. If you find a fault do not fly the model until you have corrected the problem.
- Radio interference caused by unknown sources can occur at any time without notice. In such a case, your model will be uncontrollable and completely unpredictable. Make sure to perform a range check before every flight. If you detect a control problem or interference during a flight, immediately land the model to prevent a potential accident.
- Youngsters should only be allowed to assemble and fly these models under the instruction and supervision of an experienced adult.
- Do not operate this model in a confined area.
- Do not stand in line with, or in front of a spinning propeller and never touch it with any object.

IMPORTANT: PRIOR TO ANY ASSEMBLY

Please Note: after removing kit from shipping box, lay each piece flat on a hard surface, this will allow the airframe to straighten out if lightly bent from shipping. Do not worry since EPP is very pliable and can be bent back if bent out of shape easily.

RACER TWISTED SERIES



Kit Contents:

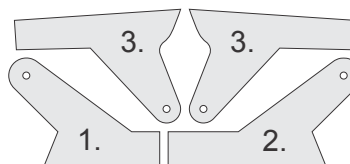
- * fuselage
- * wings
- * horizontal stabilizer
- * vertical stabilizer
- * accessory pack
- * pushrods and stiffener set

Accessory Pack Contents:

- * carbon rod 1.5dia x 50mm ... 2x
- * clevis with brass pins ... 8x
- * heat shrink tube ... 5x
- * threaded ends ... 2x
- * plastic control arm set ... 1x
- * plywood motor mount and shims

Horns etc.:

1. elevator horn
2. rudder horn
3. ailerons horns



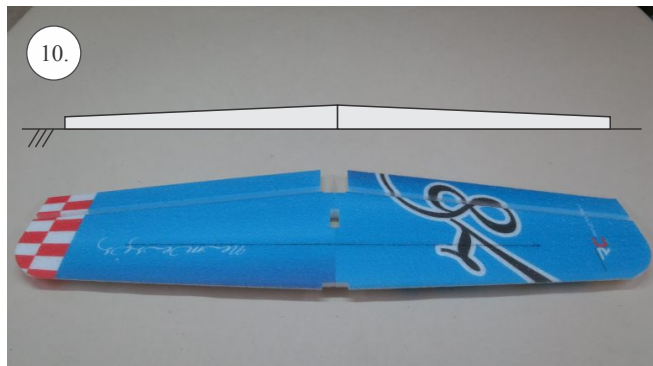
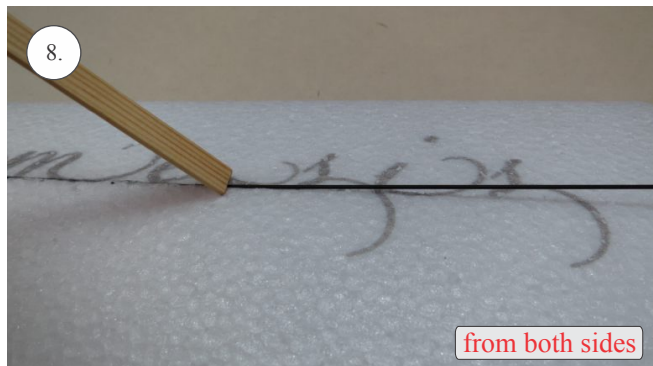
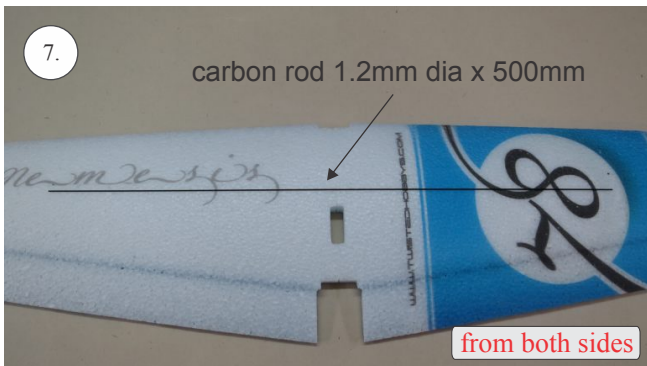
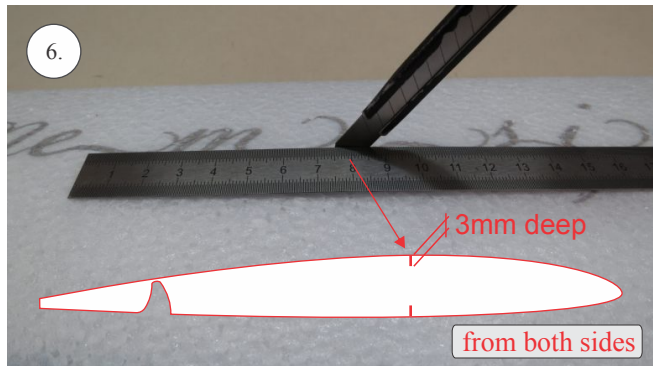
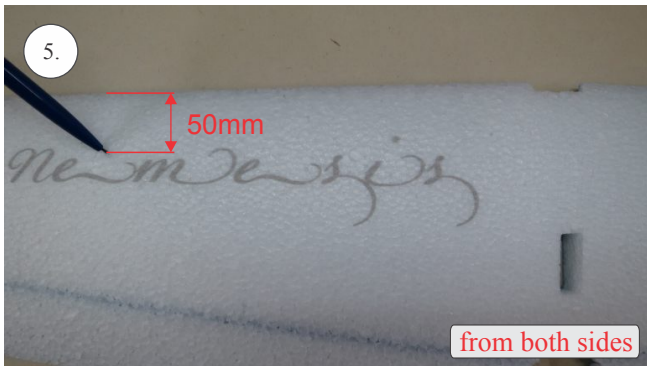
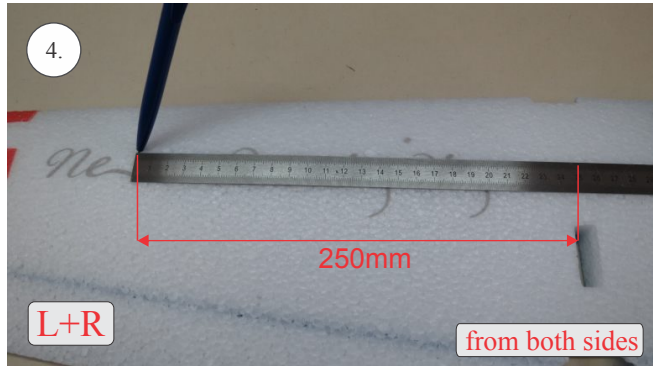
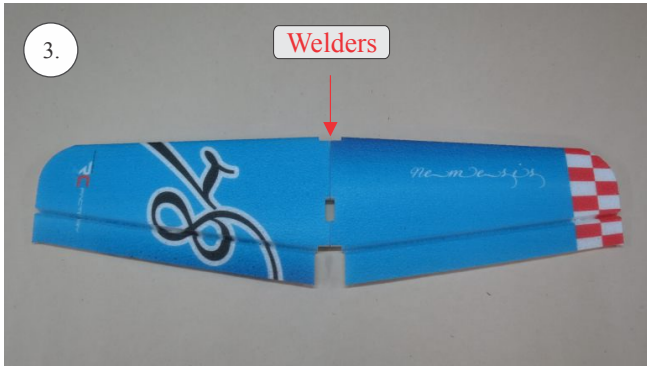
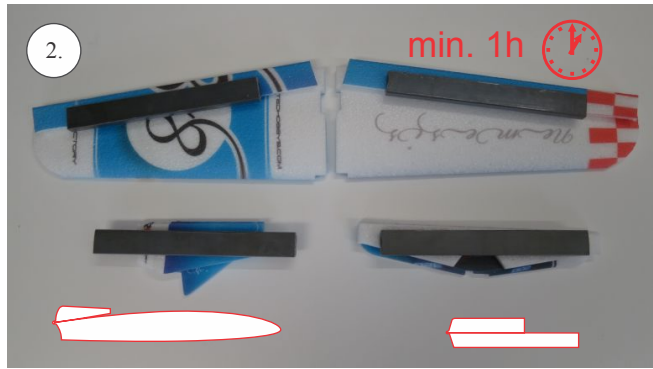
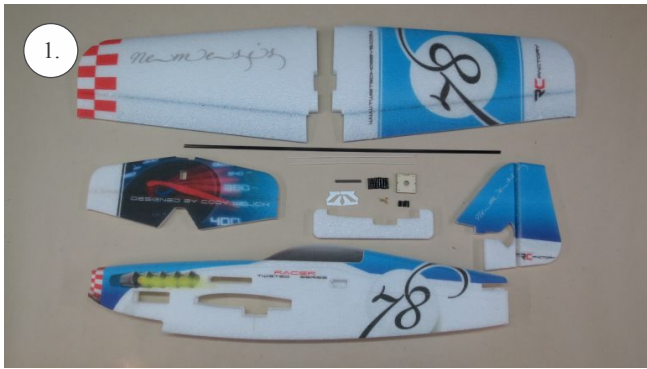
You may also need:

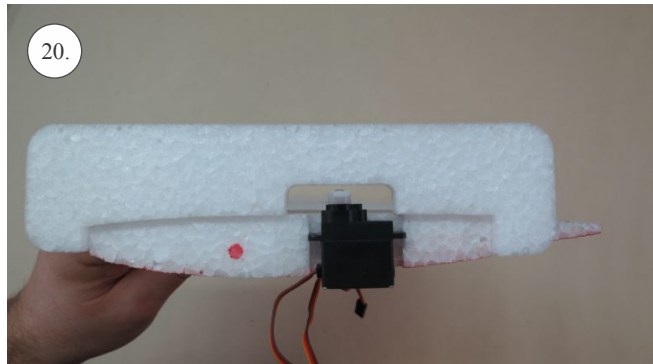
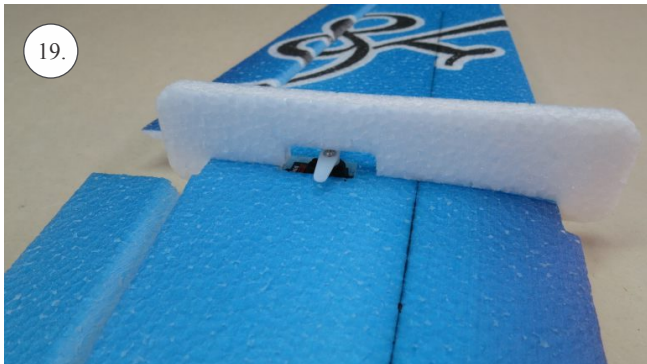
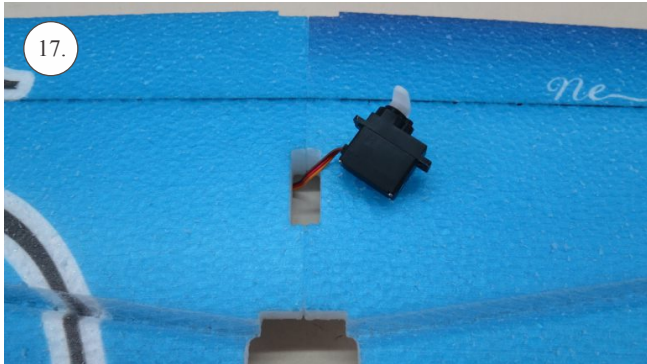
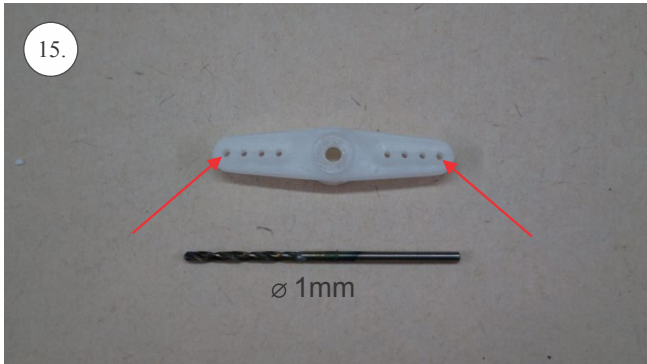
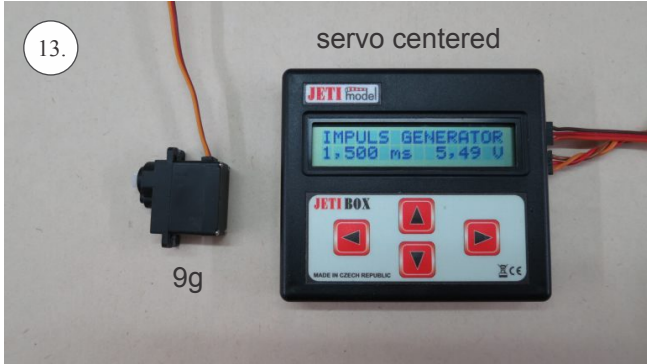
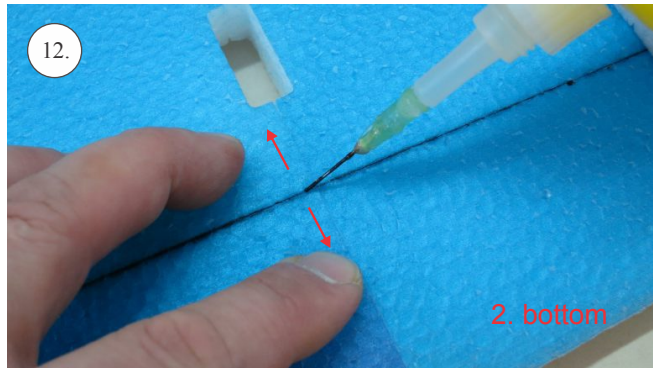
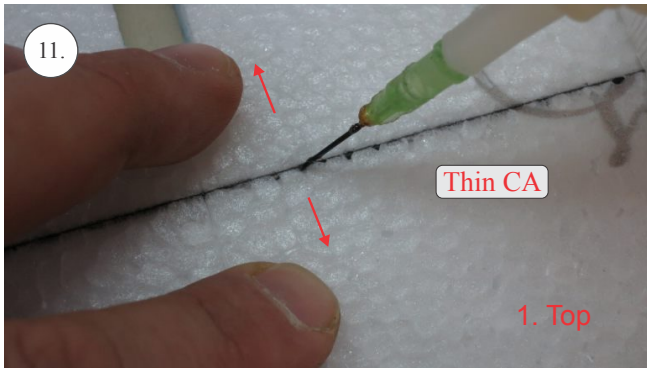
- * sharp x-acto knife
- * philips screwdriver
- * tweezers
- * little pliers
- * CA glue medium + thin, CA kicker
- * Welders or Foam Tac
- * 1mm Dia drill
- * ruler
- * pencil (marker)
- * fine handsaw (Dremmel)

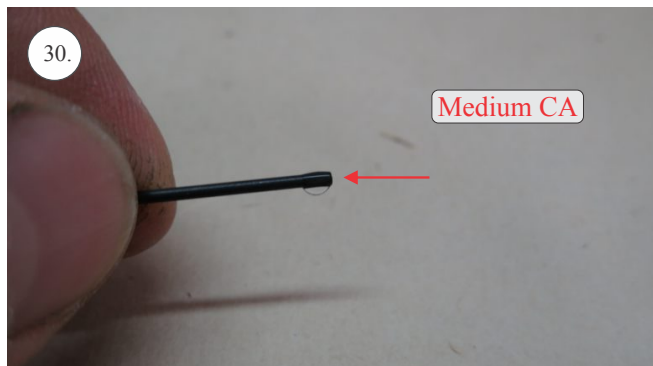
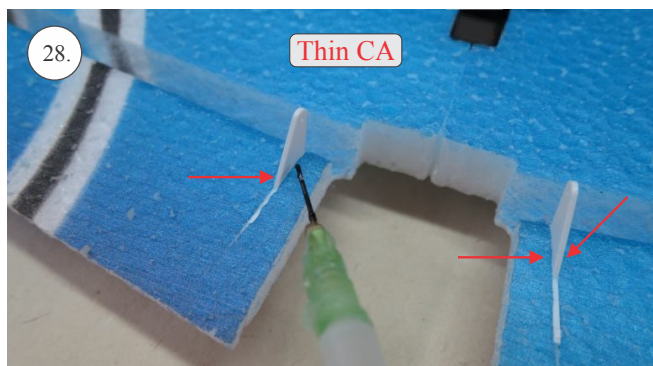
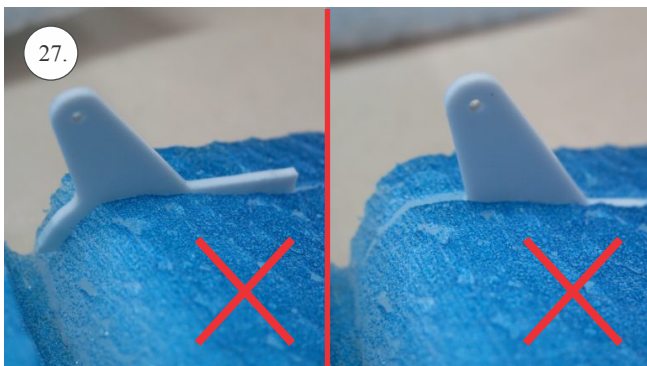
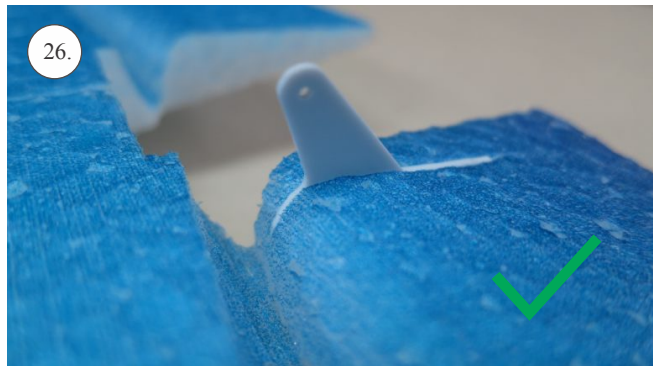
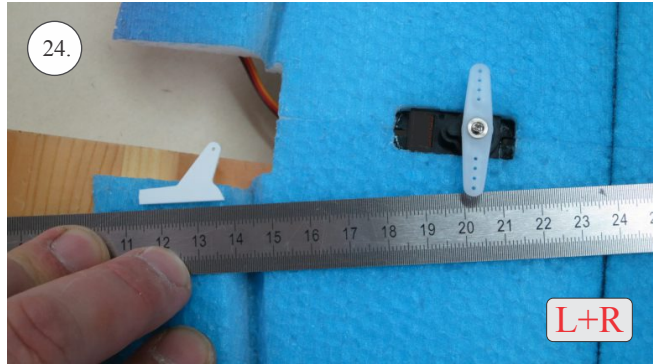
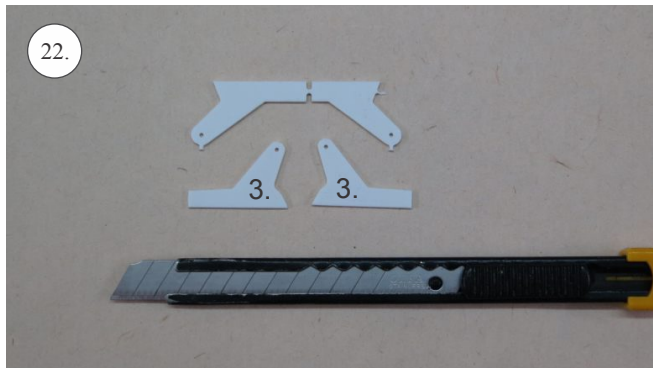
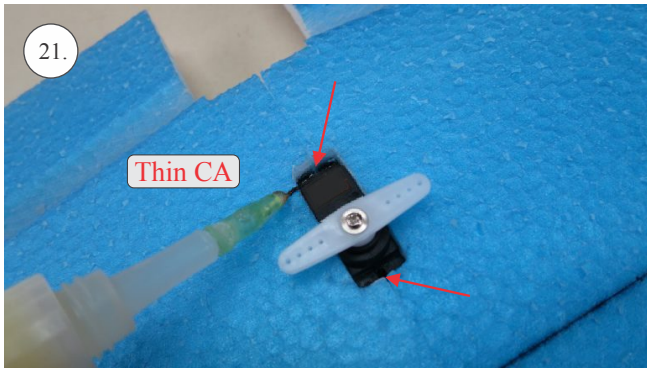
PLEASE READ BEFORE BUILDING

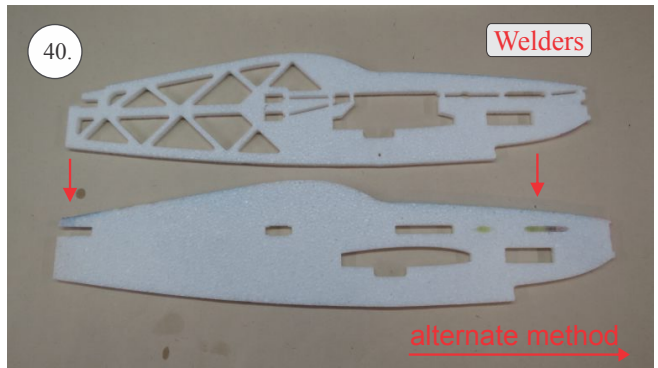
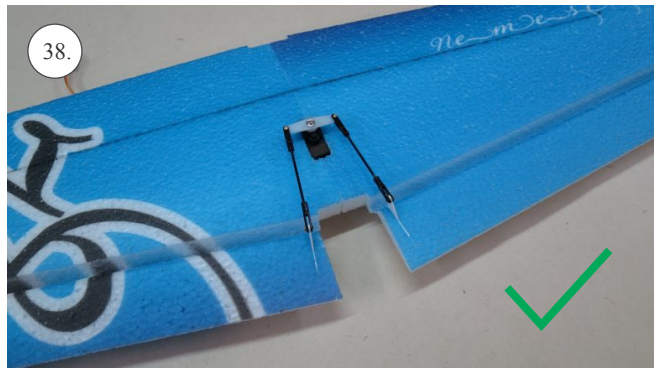
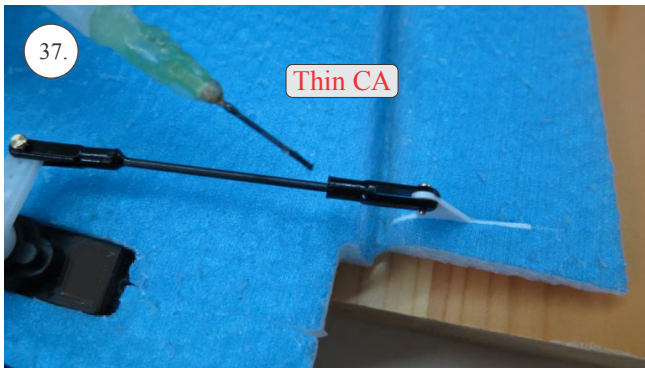
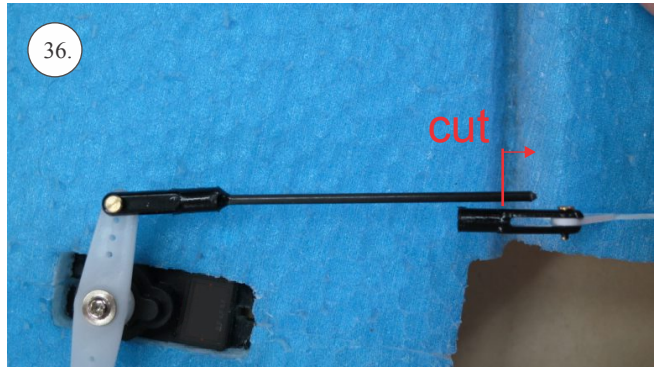
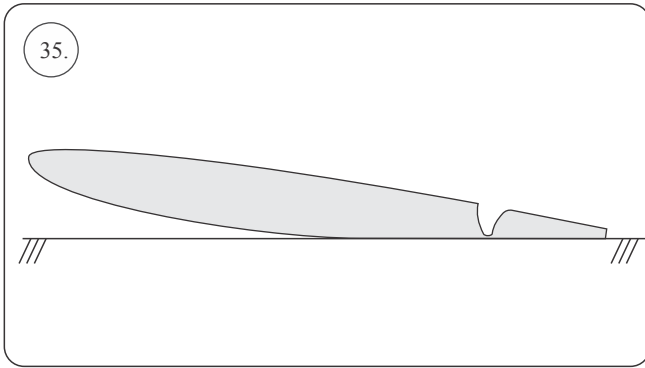
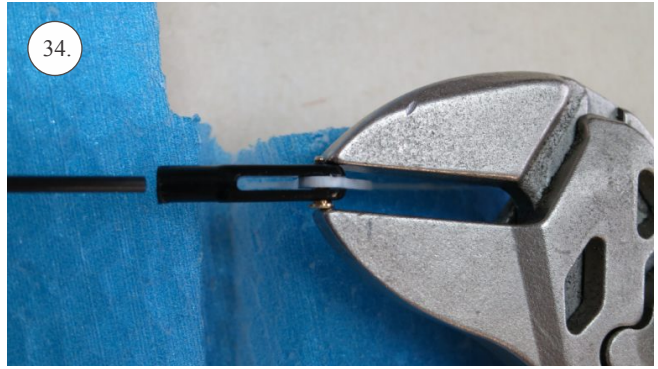
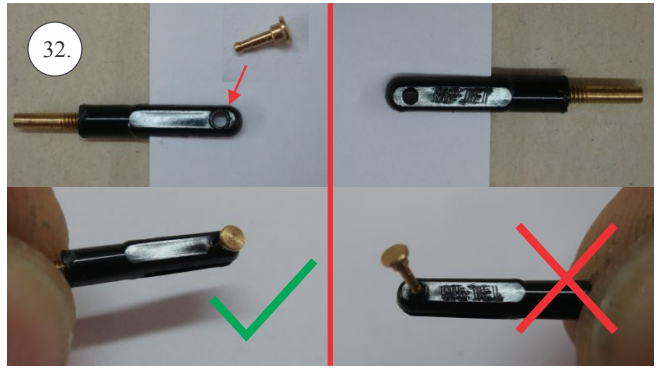
The pictures in the Manual are of the Nemesis Airframe. The other airframes build in the exact same way, but it should be noted that there may be subtle differences from this model and the one you are building.

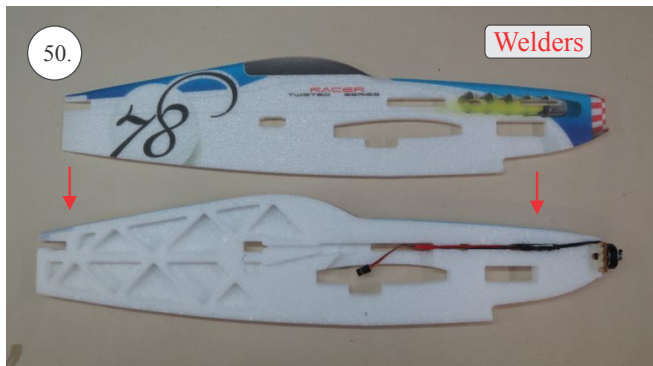
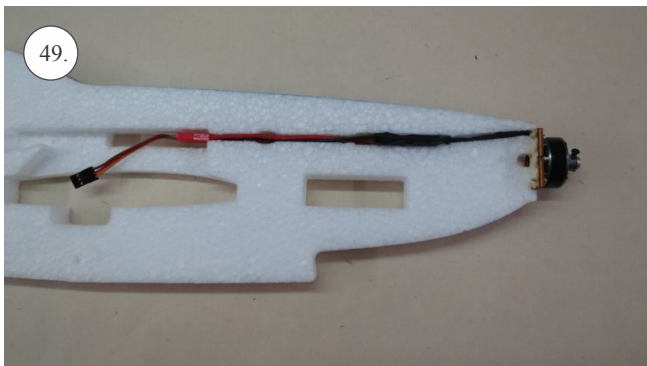
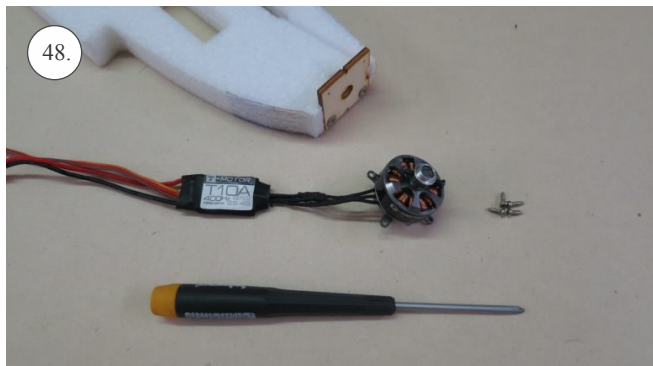
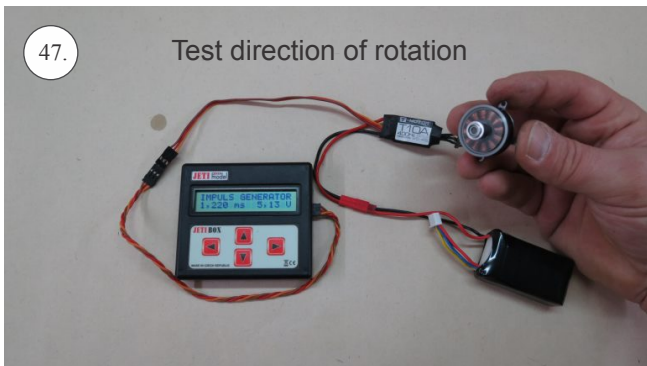
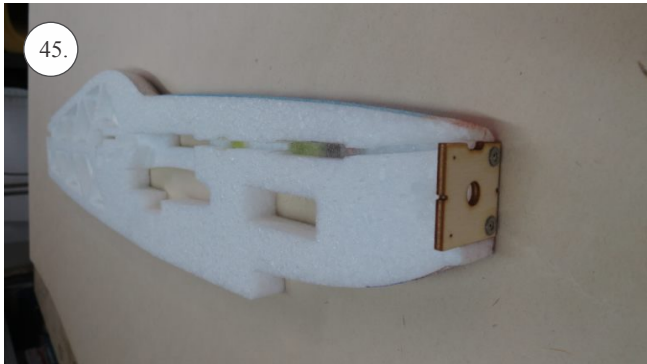
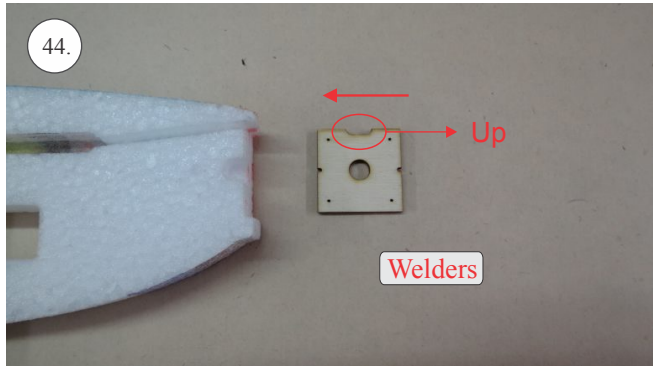
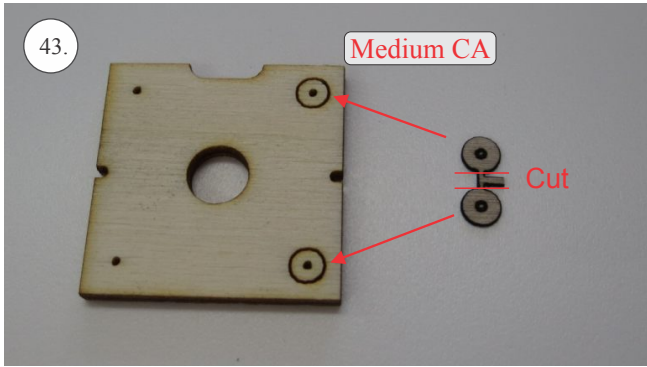
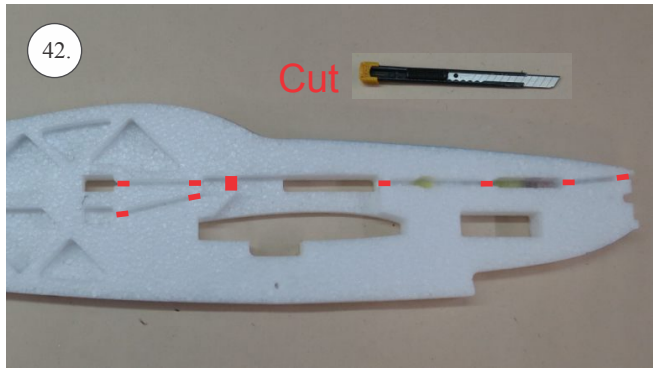
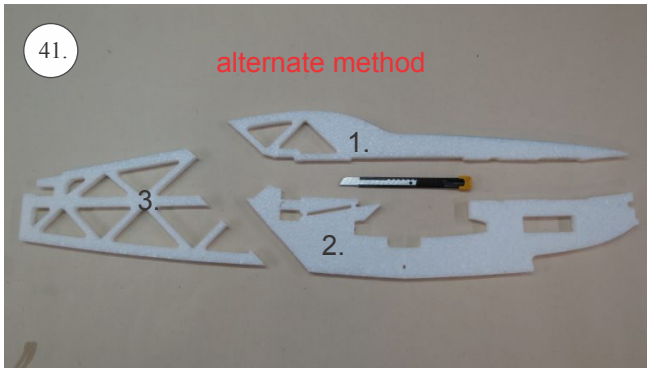
FOR ADDITIONAL BUILD INFORMATION SEE THE LAST PAGES OF THIS MANUAL FOR DETAILED DESCRIPTIONS RELATING TO EACH PHOTOGRAPH.

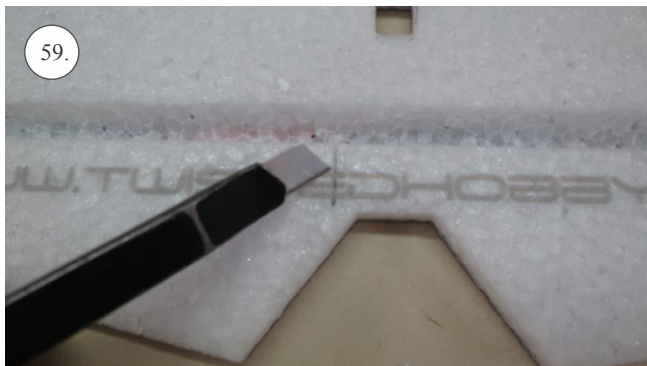
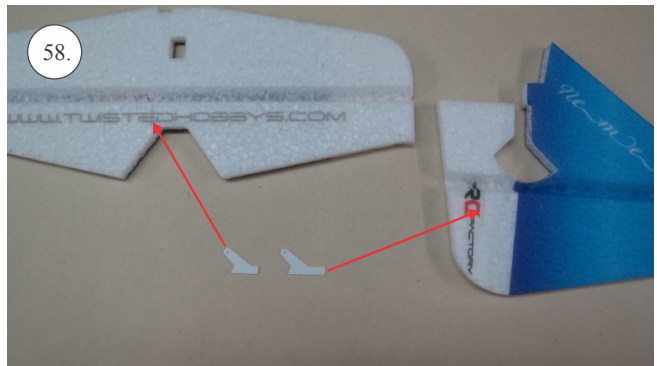
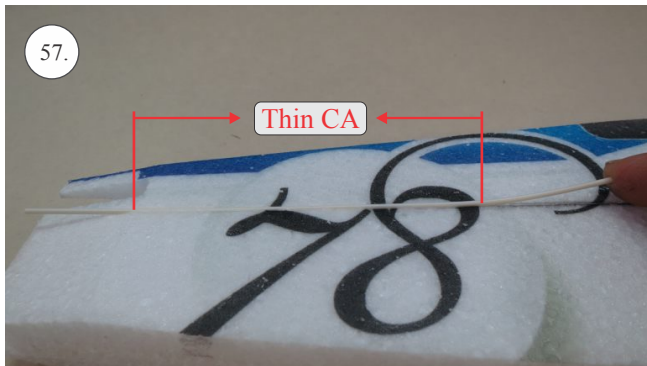
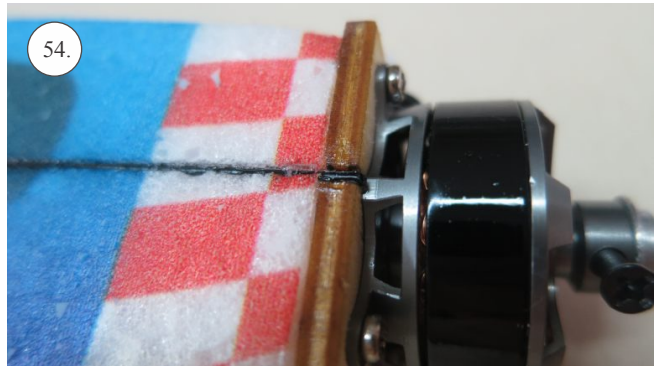


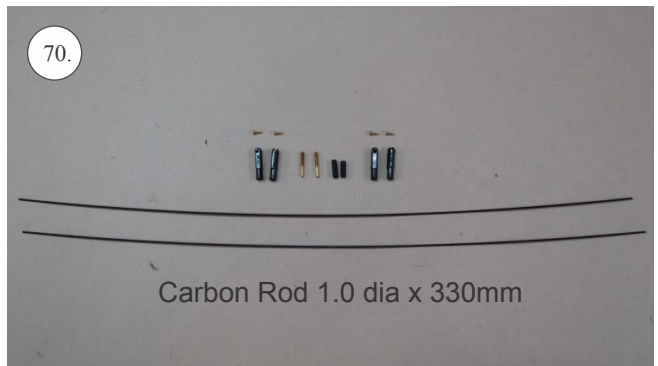
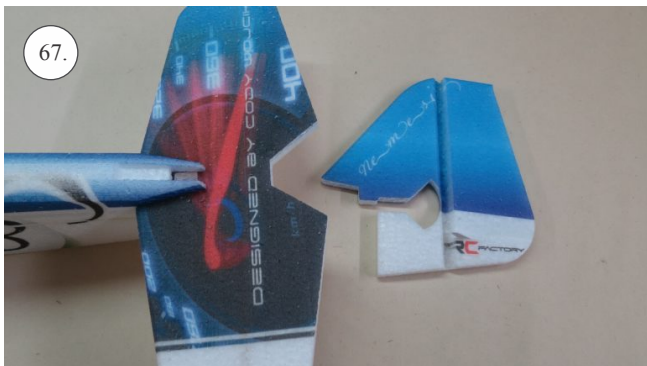
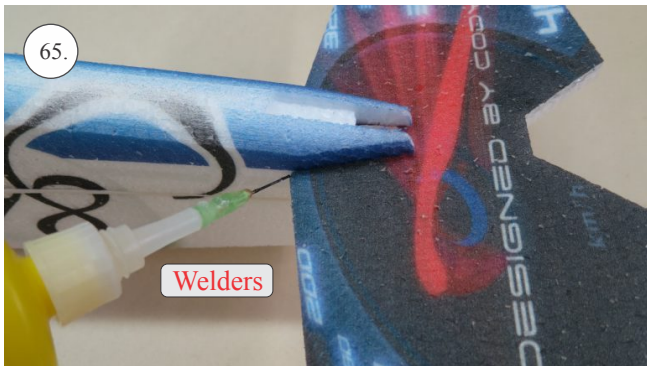
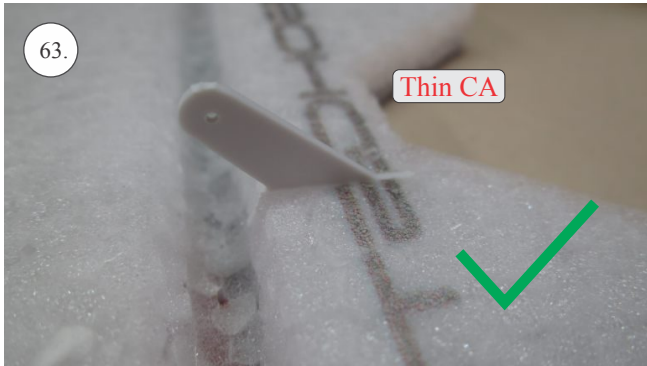
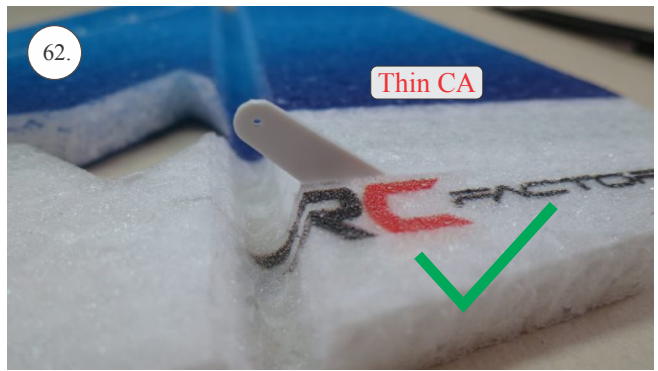
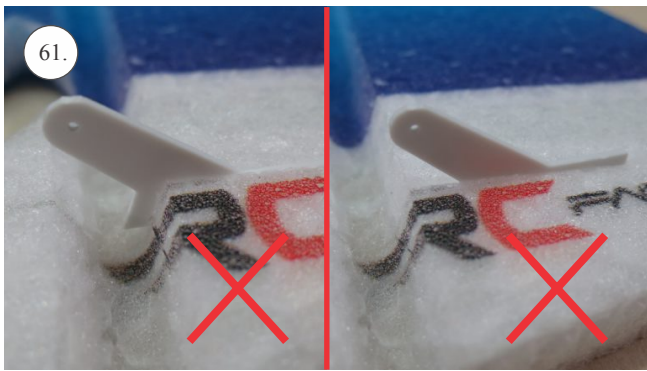


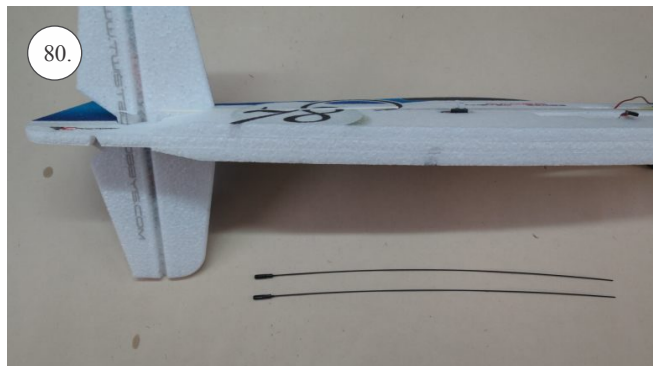
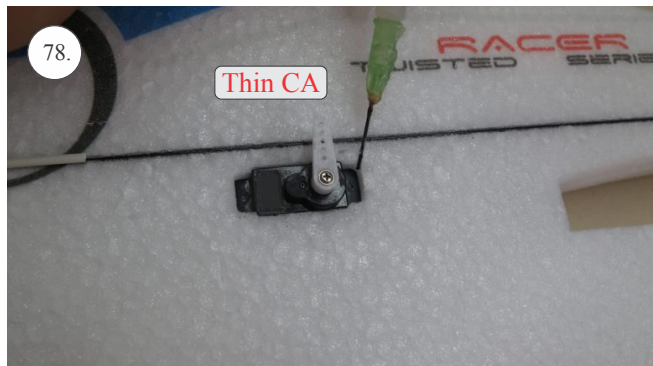
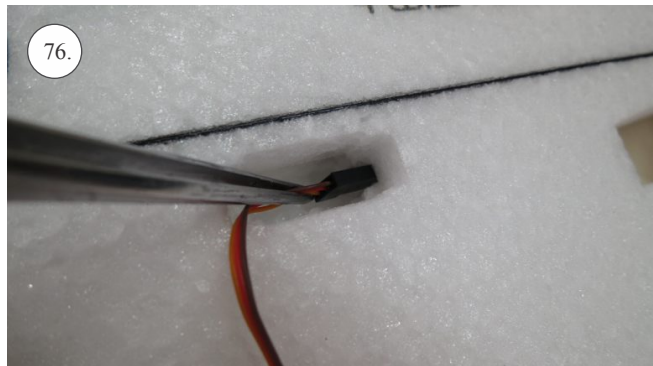
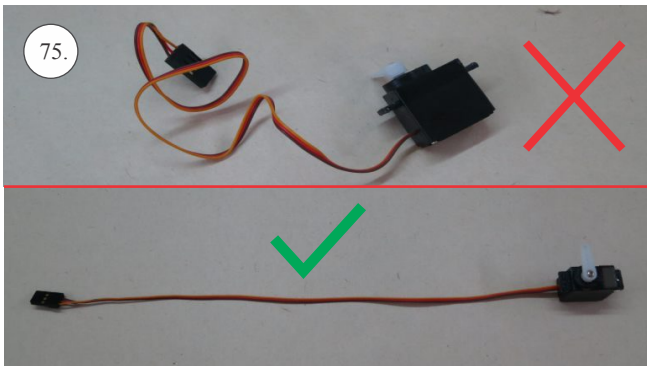
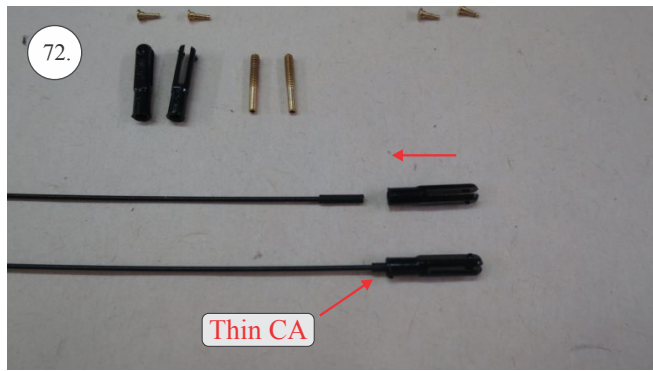
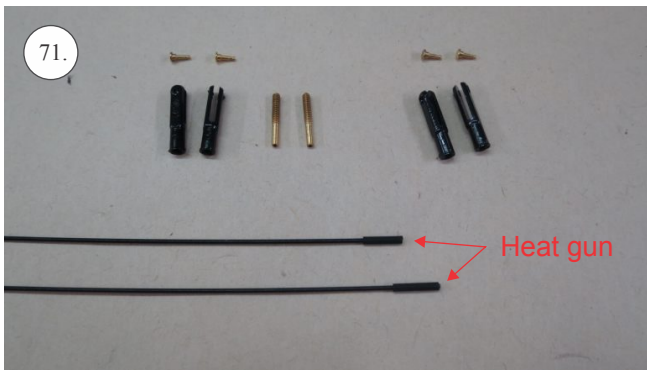


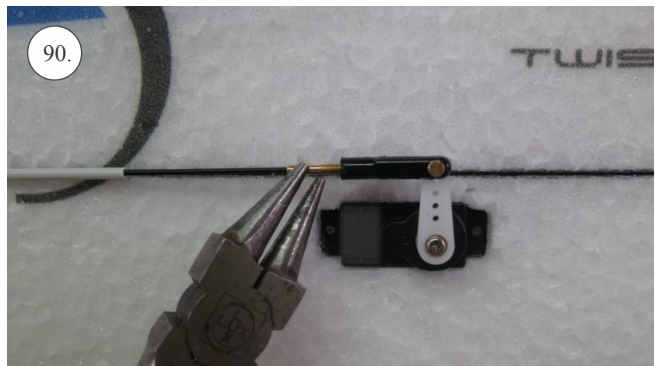
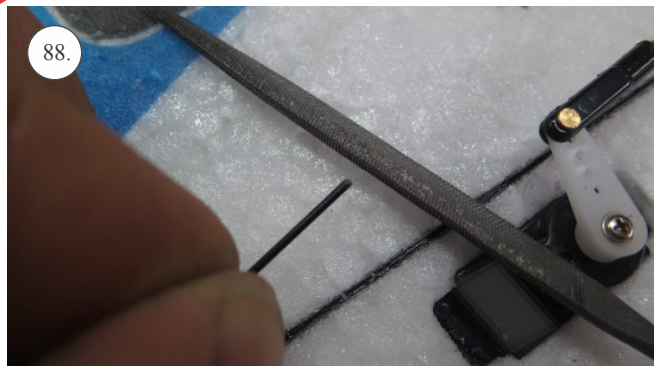
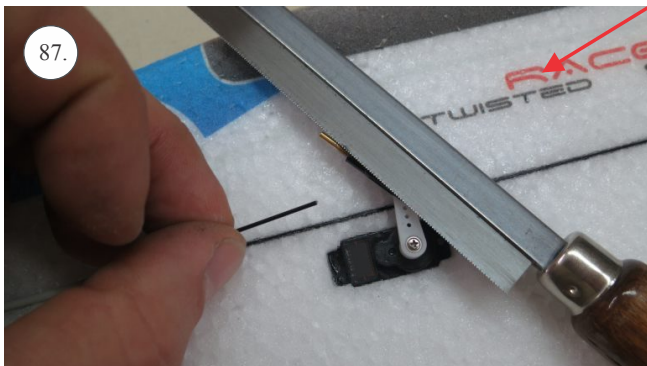
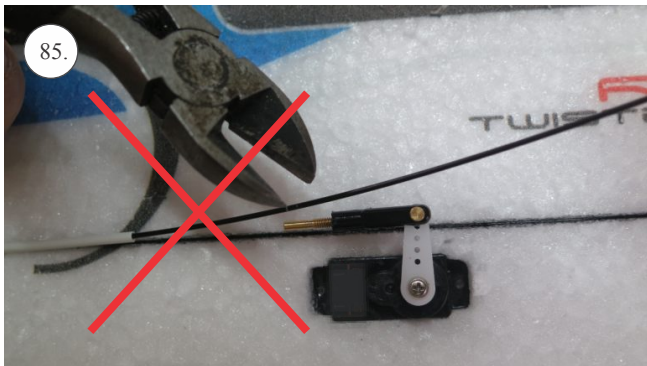
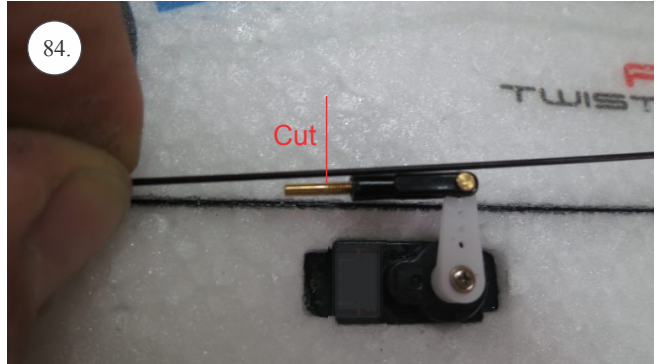
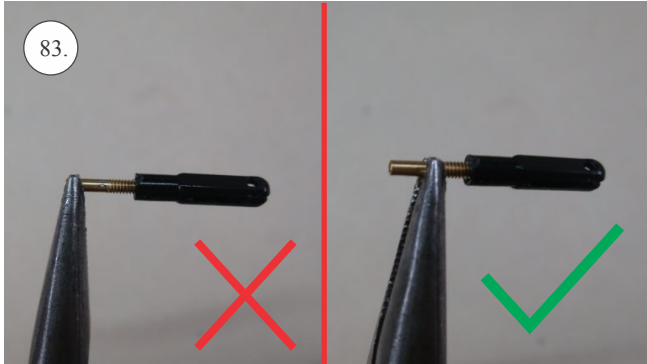
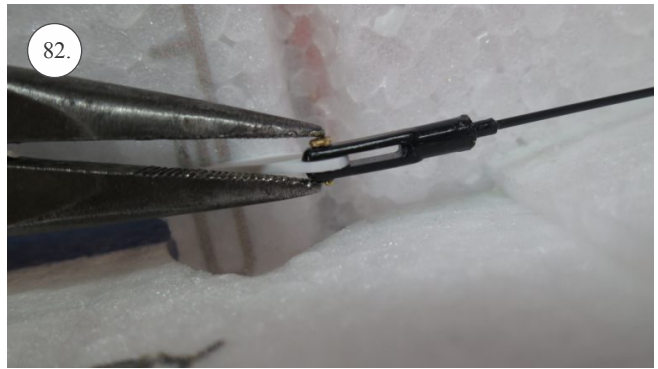
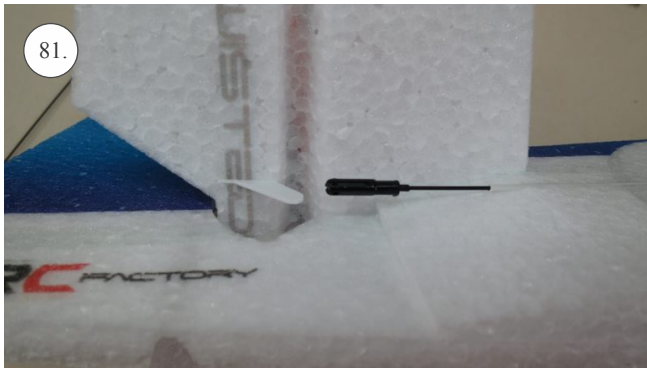


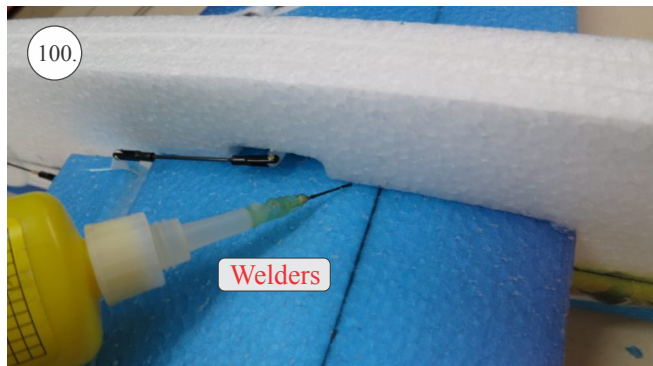
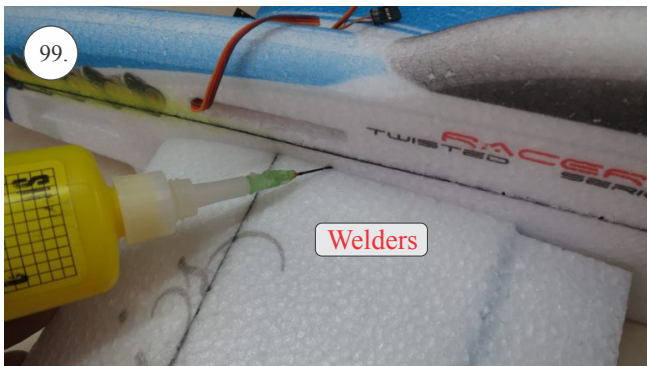
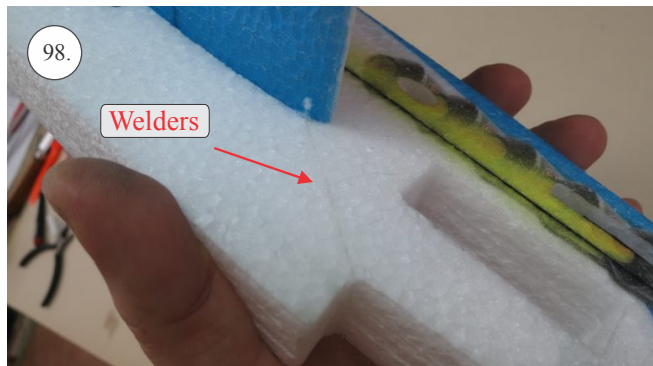
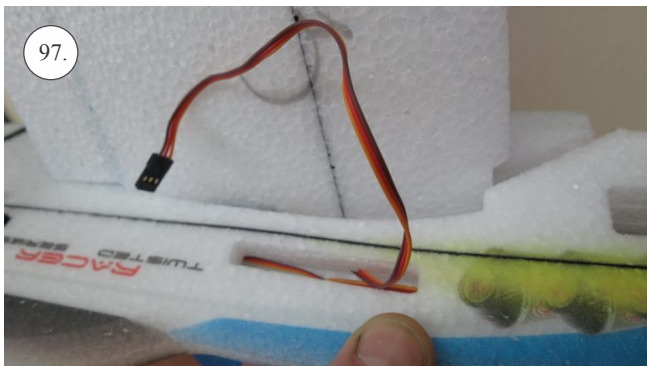
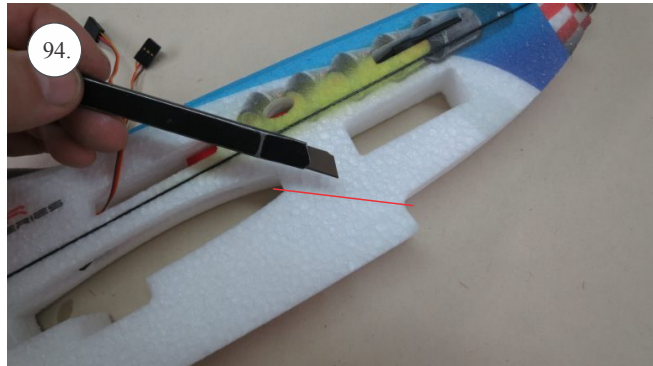
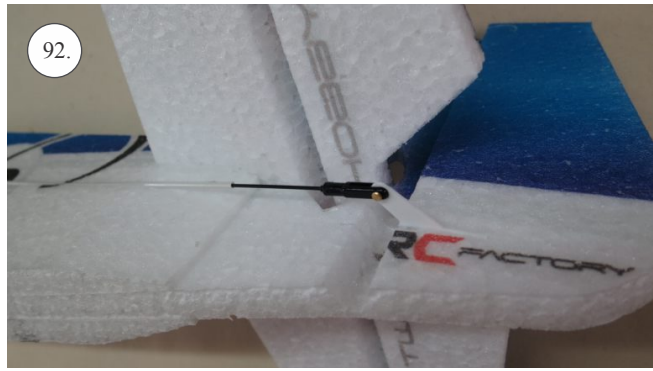
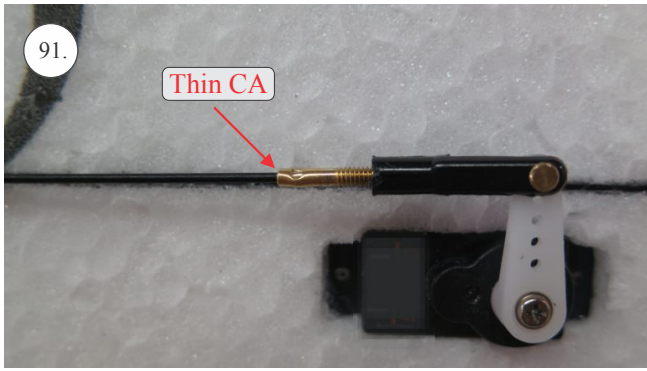


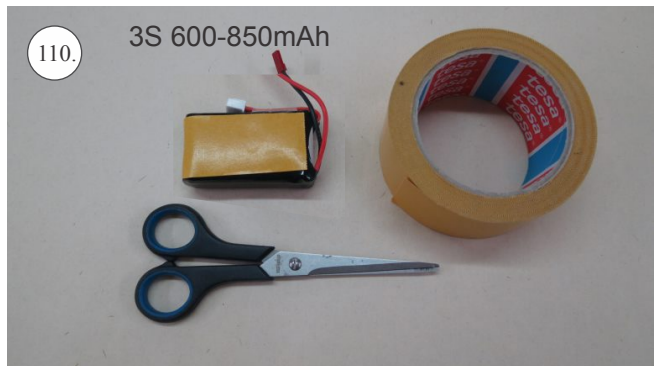
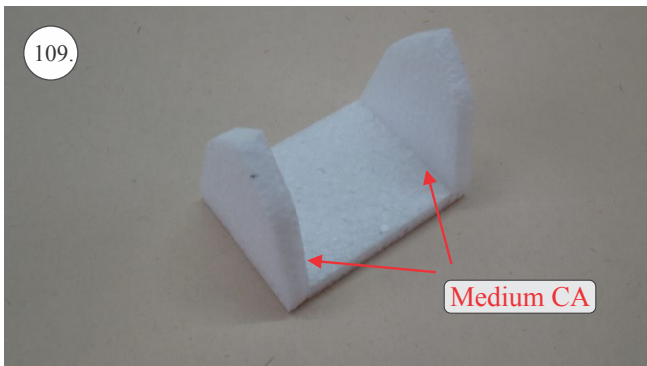
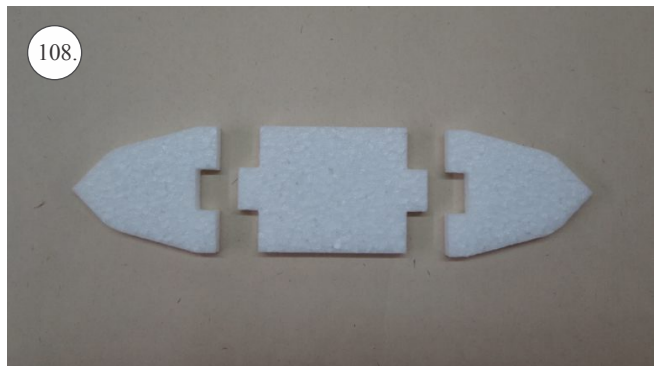
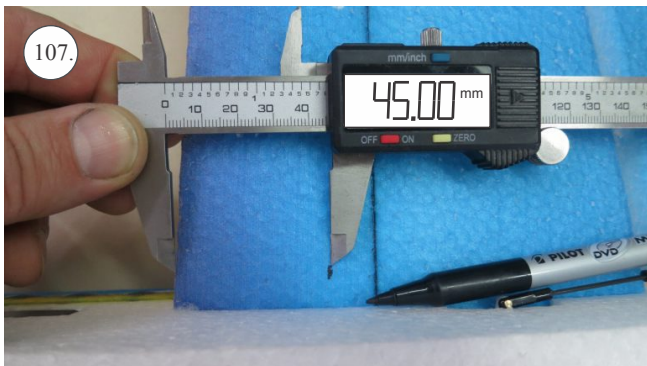
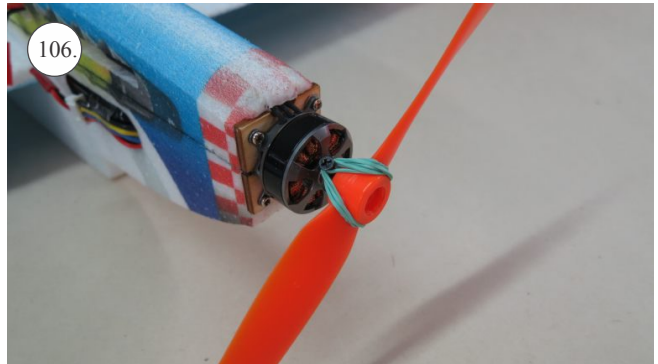
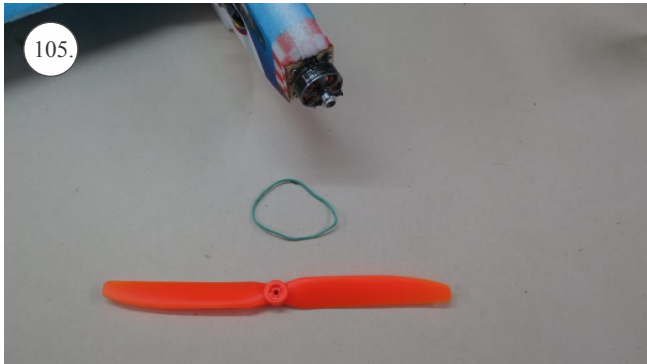
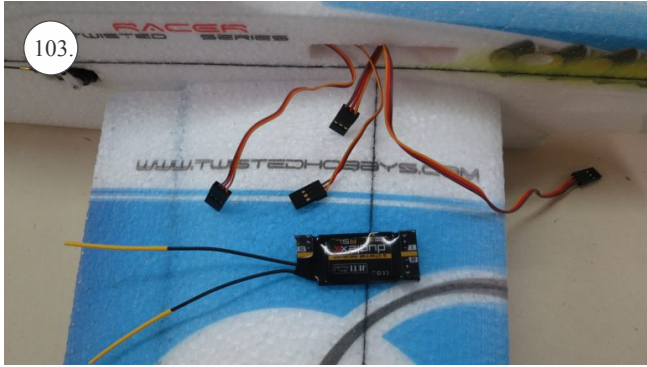
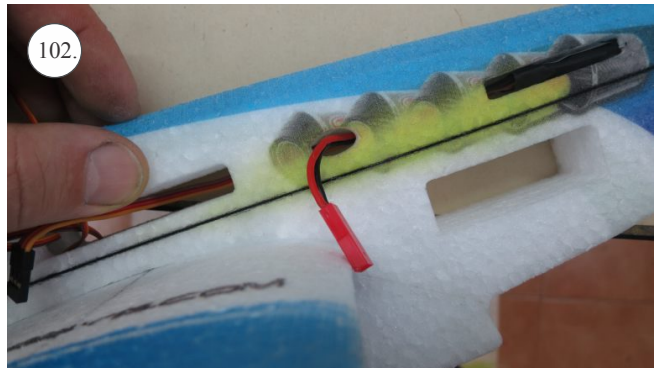
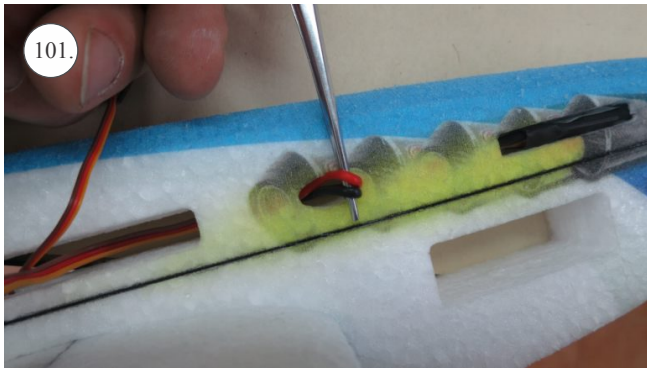


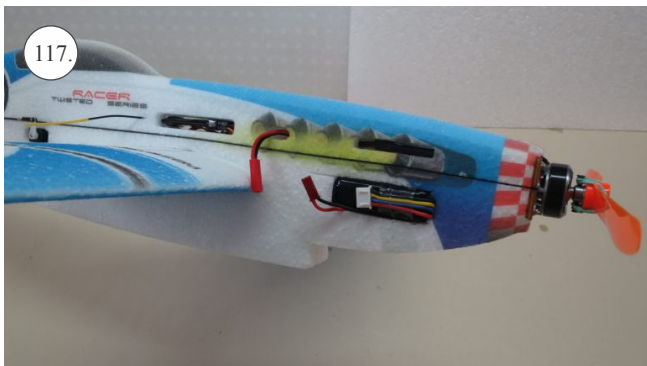
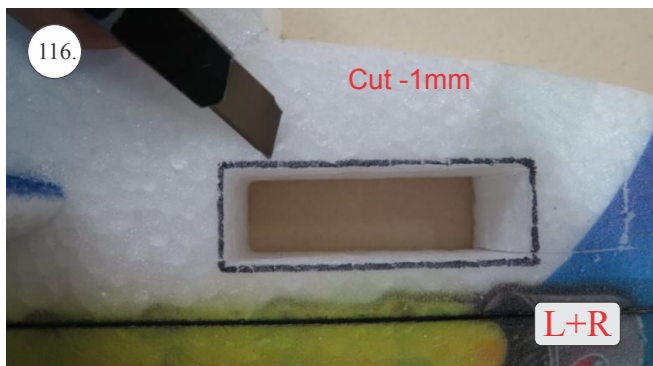
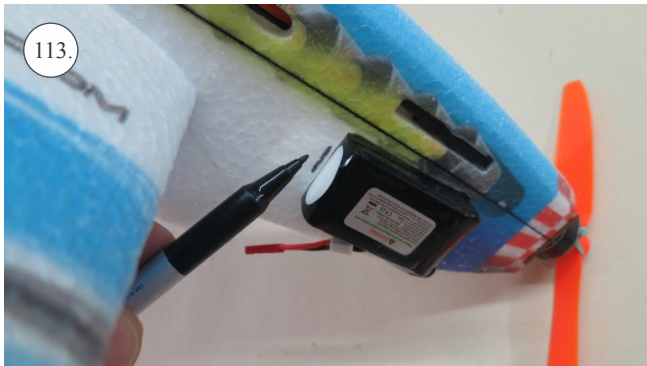
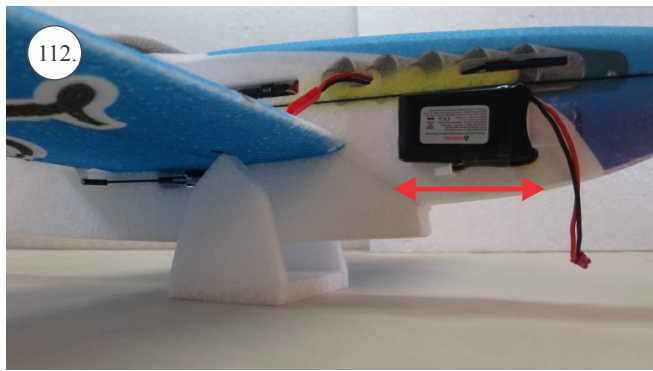
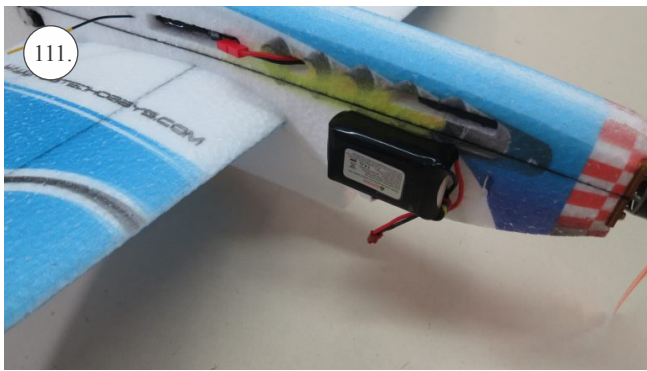










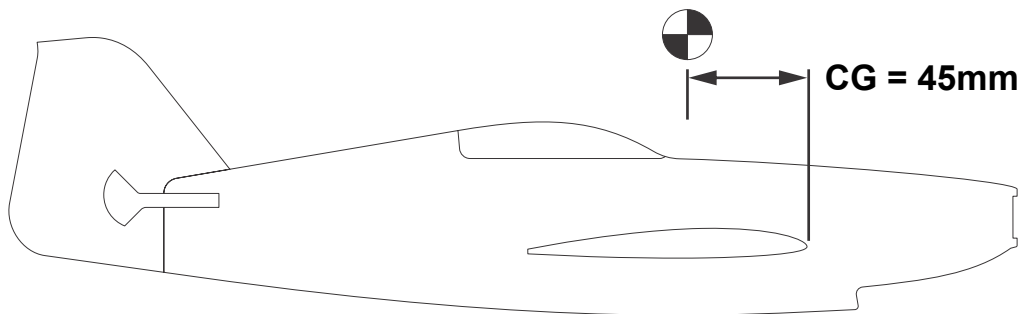


This completes the build. Center of Gravity, Control Throws and some basic radio settings are on the following pages.

Another good resource is RC Groups. Threads for these models can be found there under the Electric Warbird section.

CENTER OF GRAVITY

C.G. - 45mm from wing's leading edge



CONTROL THROWS

Advanced & Racing

Ailerons: +/- 25 deg
Rudder: +/- 30 deg
Elevator: +/- 25 deg
Expo to suit

Beginner & Sport

Ailerons: +/- 20 deg
Rudder: +/- 25 deg
Elevator: +/- 20 deg
Expo to suit



PRE-FLIGHT & TESTING

PREFLIGHT CHECKS

Motor: Should run smoothly at all stick positions, and transition smoothly from low to high RPM. If the motor is turning backwards, reverse two of the three wires between the motor and ESC. Check that the screws holding the motor to the airframe are tight and secure.

Flight Controls: Set all to neutral or level positions with sticks in the neutral positions. Ensure that all controls and linkages move freely. Double check that all hinged areas are free from rips or tears. Verify proper control surface directions. Right Roll is – right aileron up, left aileron down, Left Roll is left aileron up and right aileron down.

Batteries: Should be fully charged prior to each flight. Watch transmitter battery level and follow manufactures recommendations. Motor battery should not be drained any further than recommended by the manufacture, use a timer to prevent an over discharged condition.

Radio: All trims should be set to neutral and throttle in the low position. Check that rate switches and mixes are set properly.

Range Check: With and without the motor running per radio manufactures instructions. If there is insufficient range or significant reduction with the motor running, resolve and re-test before flying.

PREFLIGHT CHECKS

The first flights should be done with the CG at the recommended position, and reduced control rates until comfortable with your handling of the aircraft. As your experience with the aircraft grows experiment with different CG points and control rates. After all flights, check the aircraft over for damage and/or other items that may adversely affect flight performance.

This EPP Pylon Racer is a full performance aircraft and will provide hours of entertainment, including the occasional crash. If, as the result of a crash, the foam tears, simply glue with Welders or CA. Many pilots prefer Welders because it remains flexible after drying. CA however, is more suited for the “quick” repair.

This aircraft can be flown indoors or outdoors. It is however designed specifically for outdoor flying and will be right at home in the local park or other similar sized venue.

STORAGE

This EPP plane should be stored resting it's landing gear or hung from the prop. Storing in other fashions that put stress on the airframe could cause the airframe to distort. Storage in a hot car could also cause damage.

Be safe and enjoy, thank you again for purchasing a Twisted Hobbys' Product!

Twisted Racer Series Extended Instructions

left column number corresponds to the picture numbers in the manual

- 1 Lay everything out to verify your kit is complete.
- 2 Bend back the hinge line and let them set for about an hour, work it slowly, they maybe a little stiff and you don't want them to crack.
- 3 Using the Welders Tack up method, join the two wing halve together.
- 4 With a straight edge prepare to make a cut 250mm from the center, towards each top.
- 5 Cut should be 50mm back from the leading edge at the end of the 250mm measurement.
- 6 With a fresh hobby knife, make a cut 3mm deep for the entire 500mm length on both top and bottom of the wing.
- 7 Insert the 1.2mm dia x 500mm rods into both the top and bottom slots. It should be noted that there are also some 1.0mm rods, do not use these, they are the fuselage stiffeners.
- 8 Press the rods in so that they are just below flush. No glue yet.
- 9 Incorrect depth shown on the left, correct depth shown on the right. No glue yet.
- 10 Lay the top of the wing down on a flat surface and adjust so that the top will lay flat on your work surface.
- 11 Once you have the dihedral set as shown in picture 10, thin CA can now be used to secure the carbon rods.
- 12 If necessary, spread the foam slit a little with your fingers as you apply the thin CA.
- 13 Center the aileron servo. Either use a servo tester or your radio. Now is also a great time to test ALL of your electronics. It is much better to find a problem now before items are installed.
- 14 Find the servo horn that looks like the one in the picture and will allow for approx 30mm of distance as shown.
- 15 Enlarge the holes 1.0mm dia, this will allow the brass pins in the clevis set to pivot with out binding.
- 16 Mount the horn to the servo. Note that it may mount closer to perpendicular one way than the other, use which every is closest to centered.
- 17 Install the servo from the underside of the wing, with the output shaft towards the leading edge
- 18 There is an included jig that helps to determine the height of the servo placement
- 19 Use the jig as shown.
- 20 Position the servo so that there is clearance for the control arm.
- 21 Secure the servo with thin CA. Welders or Hot Glue can also be used.
- 22 Cut the aileron control horns from the tree, they are the ones labeled #3.
- 23 With the bottom side facing up, put something between the wing and work surface, this will all clearance for the servo body stick out the top side.
- 24 With a small straight edge, locate from the hole you will use to get the total 30mm spacing and a spot approx 10mm in from the edge of the aileron.
- 25 Make a cut that is just large enough to accept the control horn.
- 26 Locate the horn so that it is flush in the hinge cut our area and the bottom surface of the aileron.
- 27 Make sure that it does not look like either picture in this frame.
- 28 Once lined up and flush, secure with Thin CA or Welders
- 29 Locate the pictured items, these are used to build the aileron control rods.
- 30 Apply a drop of Med. CA on the end as shown.
- 31 Push the clevis on until it bottoms out in the hole. Set with Kicker

Twisted Racer Series Extended Instructions

left column number corresponds to the picture numbers in the manual

- 32 Note that the clevis has two different size holes, the larger hole is the side from which the brass pin will be installed.
- 33 Install the glued clevis end to the servo horn, installing the brass pins from the side of the clevis with the larger hole.
- 34 Install the loose clevis on to the aileron control surface horn. Install the brass pin from the side of the clevis with the larger hole.
- 35 Situate the wing so that the bottom side is facing up, and the rear is flush with the work surface as shown. Also make sure the servo is perfectly centered.
- 36 Test fit the control rod into the aileron clevis, trim if needed.
- 37 While holding the with in the position shown in picture 35, apply some Thin CA to the clevis as shown.
- 38 Repeat for the other control rod.
- 39 Locate the three fuselage sections.
- 40 Left side and Center section will be the first ones to glue together. Apply a medium bead of Welders around the perimeter of the center piece, as well as all the internal mating surfaces. While the glue is still wet, join the two pieces together. Make sure and sandwich them together firmly to squish flat the bead of Welders. Let dry with some weights, check often and press together as required. The two pieces with curl a little as the glue dries, just keep pressing it together until it holds on it's own.
- 41 As an alternate method, you can glue the center section on in three pieces.
- 42 Once the glue has set up, remove the webbing from the center piece as indicated.
- 43 Locate the motor mount and two wood washers. Locate the washers using the engraved circle as reference and secure with thin CA.
- 44 Using the Welders Tack Up Method, attach the motor mount as shown. Note that the notch should be up, and the wood shims facing forward, and on the left side of the fuselage.
- 45 Double check that the motor mount is flush and square and set aside.
- 46 Locate the motor and ESC that you are using for this build. You can either shorten the wires a little on the ESC or cut a small pocket in the foam between the ESC and motor, to create a place to loop the extra ESC wires, doing this eliminates the need for soldering.
- 47 Hook you motor up and test for proper rotation. The ESC to Motor connections will be buried in the fuselage, so you want to get it set up right at this time.
- 48 Locate the small screws that came with the motor. Enlarge the pre-drilled hole to accommodate the motor mount screws if necessary. Too small, then the would will split, too big then the screws will to hold. A 1/16" dia drill works well for the screws included with the Twisted Hobbys' motors.
- 49 Mount the motor, lay in the ESC and route the wires as shown. If you did not shorten the ESC wires, make sure that the pocket you create will have enough room for everything to be flush.
- 50 Attach the right fuselage side with the same gluing method as was used to attach the left side.
- 51 Locate the 1.0mm x 500mm rods.
- 52 Press them into the pre-cut slot in the fuselage sides. Start at the motor mount end, and make sure to engage the rod into the slot of the motor mount, this adds strength to the motor mount. Towards the tail, the slot gets much deeper, this is by design and the rod

Twisted Racer Series Extended Instructions

left column number corresponds to the picture numbers in the manual

- should be pressed all the way into the pre-cut slot. The tail surfaces control rods will travel thru a tube that also gets glued into to this slot in a later step.
- 53 Lay the fuselage on a flat sure to ensure it is true, the secure the carbon rod with Thin CA. Make sure to keep the near surface area where the rod is much deeper free of excess CA, as mentioned above the control rod tubes install here, and if you fill the slot with glue they will not be flush as they are intended to be.
 - 54 Make sure and get glue around the area where the carbon rod and motor mount meet, since there is some gap here, Med. CA is recommended.
 - 55 Locate the control rod tubes.
 - 56 Install the right side tube as shown. End of the tube should line up with the end of the fuselage, then (on this side only - right side), remove 15mm of the length as shown.
 - 57 Secure with thin CA in the area shown. On the servo side of the tube.. approx 35mm from the end should be left free of CA.
 - 58 Locate the tail control horns. Shorter one is for the elevator, longer one the rudder
 - 59 Make the pre-cut slot in the elevator slightly larger if needed to accommodate the horn.
 - 60 Make the pre-cut slot in the rudder slightly larger if needed to accommodate the horn.
 - 61 Install the horns so that they are flush with the near surface, and so that the match the hinge area profile. These two images show incorrect installation.
 - 62 When installed correctly the horns should look like shown here. Secure with Thin CA when satisfied with the rudder's horn position.
 - 63 Repeat for the elevator's horn.
 - 64 Time to join the elevator to the fuselage.
 - 65 If using CA, install then go around the seams with Thin CA. If using Welders, coat both mating surfaces and join the two pieces. Note that the elevator is notched to help prevent incorrect installation. Flat side should be up, side with the hinge cut should be down. Make sure the elevator is horizontal.
 - 66 If using CA, make sure and get all the seams. If using Welders, wipe away any excess glue that squished out.
 - 67 Rudder installation is next.
 - 68 As with the Elevator. If using CA, install the rudder, check for squareness and Thin CA all the joins. For Welders, coat all mating surfaces and join together. Check for squareness.
 - 69 If using CA, make sure and get all the seams. If using Welders, wipe away any excess glue that squished out.
 - 70 Tail surface Control Rods - Locate the items shown.
 - 71 Start by heat shrinking the included tubing on one end of each rod.
 - 72 Install a clevis on that same end and secure with Thin CA.
 - 73 Electronically center the servos and temporarily attach the control horns. Control horn orientation is not important yet, just the centering is.
 - 74 Elevator servo installs from the right side, with it's out put shaft towards the nose.
 - 75 Straighten out the servo leads.
 - 76 With a pair of needle nose or tweezers, feed the servo lead thru is passage to the radio bay.
 - 77 It should feed thru easily and come out in the cut out area above the wing.
 - 78 Firmly press the servo into it's pocket and secure with Welders (or Thin CA).

Twisted Racer Series Extended Instructions

left column number corresponds to the picture numbers in the manual

- 79 Install the Rudder Servo. Picture shows output shaft to the rear, but can also be installed with the output shaft to the front. Installing it to the front will give the servo lead a more direct route to the radio bay.
- 80 Time to install the control rods.
- 81 Feed one of the control rods thru the tube for the elevator, and install the brass pin as shown. As noted earlier, the clevis' have two different size holes, install the brass pins from the side with the larger hole.
- 82 Pinch/snap the brass pin into position with a pair of needle nose pliers.
- 83 Next, locate the brass threaded ends and a clevis. Thread the clevis on so that there is approx. 9mm of TOTAL exposed brass. Make sure and grab the thread brass fitting near the threads when install the clevis. If you grab near the open end of the fitting it will crush the inner diameter and you will not be able to insert the carbon rod.
- 84 With the control surface and servo both perfectly centered, cut the control rod to length. The depth of the inner diameter reaches to where the threads are on the outside, so that can be used as a gage for where to cut.
- 85 Do not use wire cutters, they will crush the carbon fibers and make the control rod weak.
- 86 Use a small rotary wheel. Be sure to wear safety glasses and a dust mask.
- 87 As an alternative, a razor saw can be used.
- 88 Clean up the cut end a little if needed. The fit into the threaded brass fitting is not tight, but it is a close fit, if the carbon rod is frayed on the end it will not feed into the inner dia of the rod cleanly.
- 89 Install the rod into the threaded brass fitting.
- 90 With both the servo and control surface centered, make a small crimp as shown.
- 91 Add Thin CA to the open end of the thread brass fitting and hit with kicker.
- 92 Move over to the rudder side, feed the control rod thru the tube and secure the clevis as was done with the elevator.
- 93 Secure the rudder servo clevis end as was done with the elevator servo. Picture shows the output shaft to the rear, but forward facing is a better option.
- 94 Time to install the wing. Make a cut all the way thru the fuselage at the area indicated by the red line. To make a clean cut make sure you knife is sharp, and long enough to reach all the way thru.
- 95 Spread the fuselage as shown.
- 96 Slide the wing into position.
- 97 Make sure to feed the aileron servo wire thru the fuselage and into the radio bay area.
- 98 Test fit before gluing, make sure that the seam can be closed back up with out too much force. Once satisfied with the fit... pull the wing about half way out and put Welders on all the mating surfaces that can be reached. Use masking tape wrapped around the fuselage to help hold the seam closed until the Welders is dry. This is an important seam, so let the Welders dry overnight before removing the tape.
- 99 Lay down a small bead of Welders all around the corner were the fuselage and wing meet. Medium CA can be used for the cut seam and Thin CA for the corner areas, but Welders is preferred for flexibility and strength.
- 100 Make sure to do a small fillet of glue around the bottom of the wing as well.
- 101 If you buried the ESC power wire during the right side fuselage assembly step, it can not be pulled thru, be careful to not damage the wires.

Twisted Racer Series Extended Instructions

left column number corresponds to the picture numbers in the manual

- 102 Let it dangle thru the oval hole as shown. It should also be noted here that the manual shows a battery cutout, in most kits this hole is not present, and the builder will add their own hole at a later step to fit the battery being used and located for proper CG.
- 103 Pull all the wires thru to one side and attach them to their corresponding channel on the receiver.
- 104 Stuff the receiver and wires into the radio bay. There is more room inside to the rear of the radio bay, if needing some extra space for longer wires.
- 105 Locate the prop and O-rings.
- 106 Attach the prop.
- 107 CG is 45mm back from the leading edge of the wing at the fuselage. Make a mark there on both sides. Extend the mark out perpendicular from the fuselage about 50mm, this will allow you to accurately place the included CG balancer in the correct location.
- 108 Locate the CG Balancer parts.
- 109 Glue them together with Med. CA.
- 110 Attach a piece of double sided tape to the battery you will be using.
- 111 Put the airframe on the CG Balancer with the points right on the line that was made a couple steps back.
- 112 Move the battery location back and forth until you have perfect balance. Double check that the CG Balancer points are still on the line.
- 113 Mark the battery location as shown.
- 114 Trace around the battery using the mark from #113 as reference.
- 115 Prepare to remove the foam.
- 116 Make the cut about 1mm inside the trace that was made in the previous step. If you have a long blade you can do it all from one side, if not cut half way thru from both sides.
- 117 Install the battery. It should have some resistance, so that it will not fall you in flight, but not so much that it distorts or tears the foam around it.
- 118 Depending on setup, ready to fly weight should be between 220 and 250 grams