



fun series

30" Crack Wing

By RC FACTORY



Specifications

Wing span – 30" / Length – 14"

AUW 90 - 100g

2000-2800kV outrunner motor (11g – 18g)

6 - 12 amp ESC / 2s 180 – 250mAh battery

4 ch radio with Elevon Mixing

2x 4g to 7g servos / 6x3 to 7x3.5 prop

USA Distributor

Twisted Hobbys

www.twistedhobbys.com



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TWISTED HOBBYS

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

Thank you for your purchasing a Twisted Hobbys' model. 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.

Thank you for shopping with Twisted Hobbys!

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 ever flight that the airplanes' 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 out of shape.

KIT CONTENTS



30" Crack Wing

standard parts list:

- 2x – wing half
- 2x – side fin/rudder
- 1x – fuselage (3 parts)
- 1x – 1.5mm x 7.0mm x 290mm wing spar
- 1x – 1.5mm x 7.0mm x 600mm wing spar

hardware packet:

- 2x – 1.0mm dia x 130mm push rod
- 2x – wood horns
- 2x – heat shrink tubing pieces
- 2x – z-bend wires
- 2x – quick connectors
- 1x – motor mount

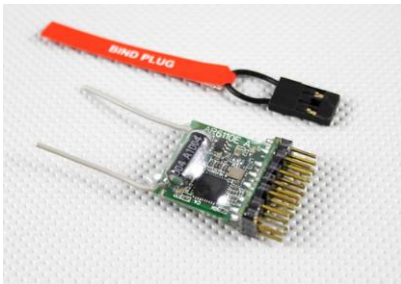
OPTIONAL PARTS



Power Combo Kit

(Matched by Twisted Hobbys)

- 1x – 12g Crack Series 2650 kV motor
- 1x – Twisted Hobbys 6A ESC w/dbl bec chip
- 1x – 4.6g Digital Ball Bearing Nano servo
- 1x – prop 6x3



Micro Receiver

Minimum of 4 channels required



Perfect choice for building and repairing your Twisted Hobbys EPP planes! This is the only adhesive you will ever need. Welder virtually bonds anything to anything! Clear, heavy-duty, flexible and water-proof when dry. Use indoors or out. (1) 1 oz tube



CA and Kicker

Various thickness CA glues and Activator available from Twisted Hobbys'



Bullet Connectors

2mm gold plated / 3 pair



2s Lipo Battery

180 or 250 mAh / 25-50C

Note: many of these “optional parts” shown or similar items, may be available from the Twisted Hobbys' web store.

TOOLS & ADHESIVES NEEDED



- Tape Measure and Ruler
- Lighter
- Small drill bits
- Welders Glue
- Hobby Knife w/new Blade
- Needle Nose Pliers
- Wire Cutters
- Low Temp Hot Glue Gun
- Course Sand Paper
- Scissors
- Small Phillips Screw Driver
- CA and Activator
- Approx 18" string/thread

THE BUILD

CONSTRUCTION METHODS:

Building surface should be at least 2ft x 4ft and flat. Weights or some small heavy objects will be handy for holding things in place during the time glue is setting.

Welders glue is used exclusively for this build, except for the control rod ends, which are glued with thin CA. **When using the Welders glue, apply a thin film to each surface, allow to sit for approx five minutes and then assemble.** Note that this method will create a nearly instant bond, so locate carefully when bringing the two pieces together. If alignment is necessary while gluing the two pieces together, do not allow the glue to tack up, simply apply and join immediately, you will have several minutes to locate the two parts before the glue sets up. In most cases the parts being glued can be handled with care in 30 minutes, full cure is approx 24 hours.



STEP 1

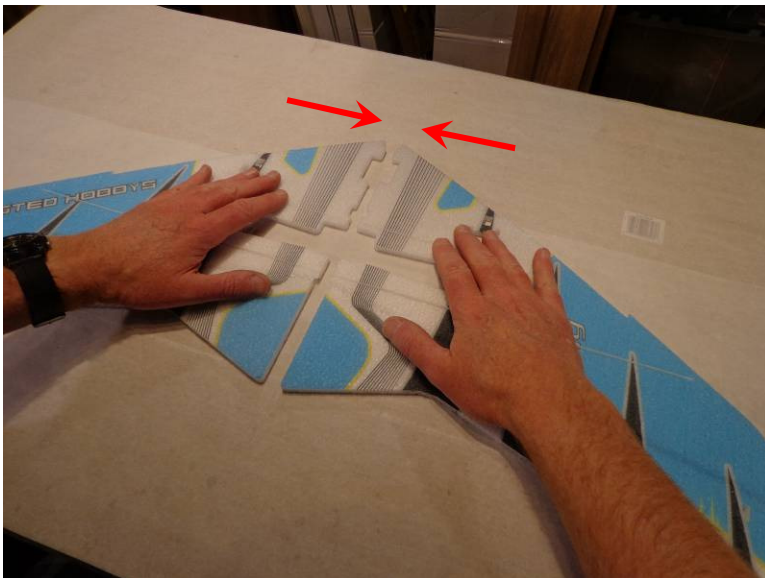
On a flat building surface (covered with Parchment or Wax paper) locate the two wing halves and test fit them together. When assembling you want the cut outs for the spars to line up with each other.



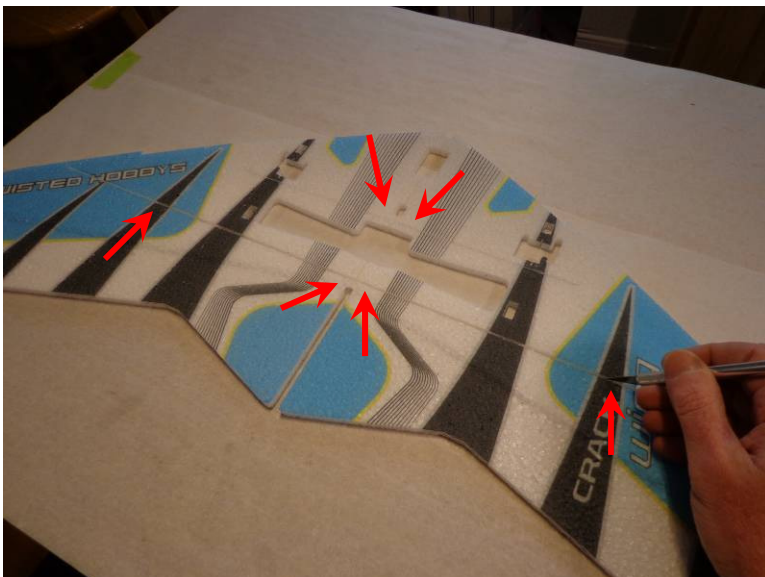
Apply a thin layer of Welders to the contact area of both wing halves, allow to tack up for approx 10 minutes.



Carefully align the spar slots.



While maintaining alignment, bring the two halves together and press firmly.



STEP 2

Remove the support tabs from the spar slots.



Locate the wing spars, check their fit into the slots.



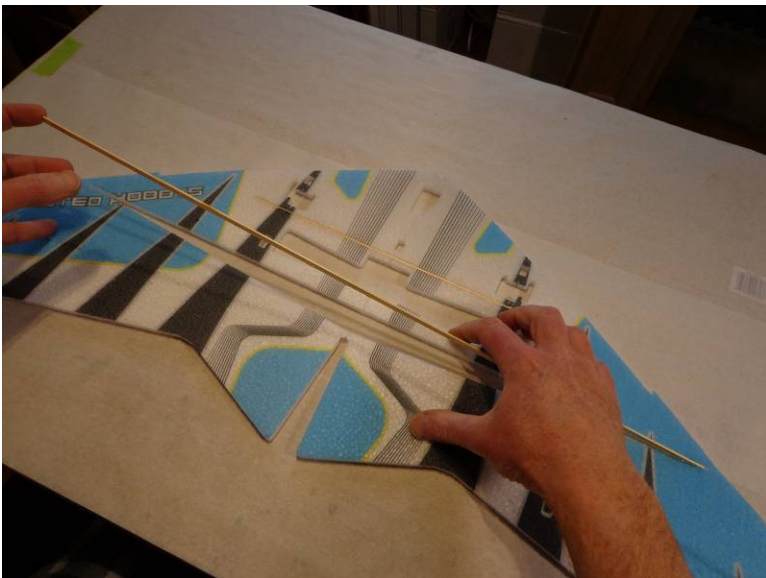
Coat both sides of the short spar with a bead of Welders.



Insert the spar into the forward slot, spreading it a little as you go to help the glue get all the way in.



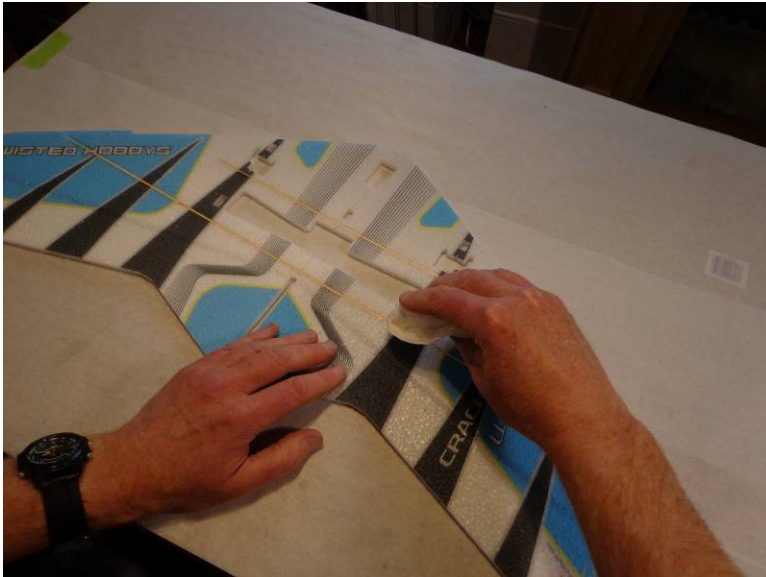
Coat both sides of the long spar with a bead of Welders.



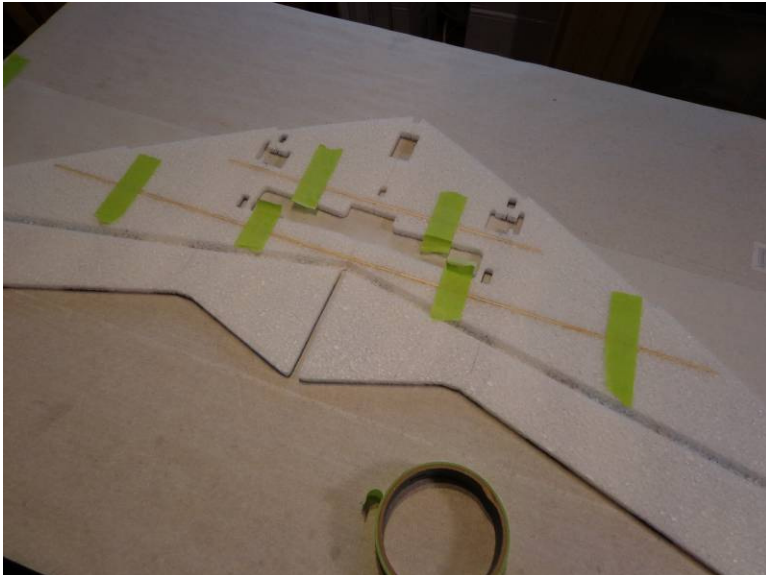
Insert the spar into the rearward slot, spreading it a little as you go to help the glue get all the way in.



Press the foam against the spar to secure the bond.



Wipe off any extra glue from both sides



Use some tape (high tack tape shown) or other means to maintain pressure on the glue joint while it cures



Add some weights to hold everything flat while the glue dries.

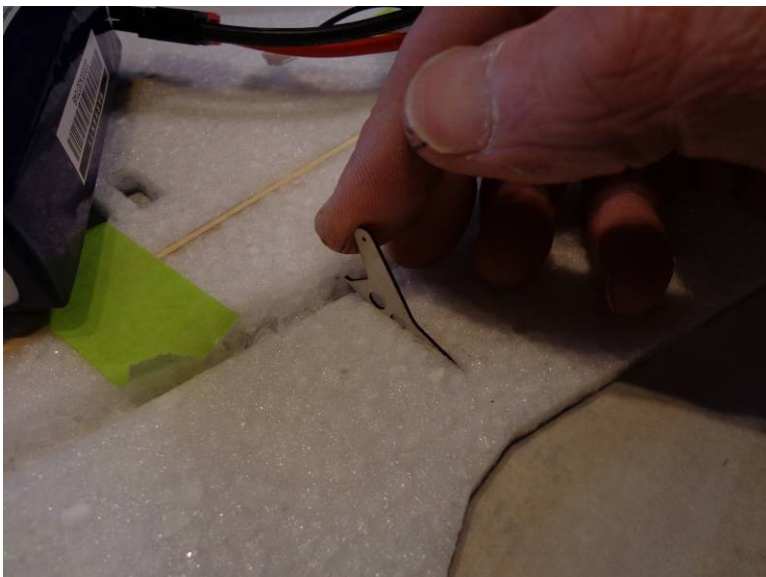


STEP 3

Locate the wood control horns.



Complete the pre-made slot in the Elevon so that it extends all the way through



Test fit the horn.



Coat both sides of the horn with Welders.



Lay a small bead of Welders into the slot.



Install the horn into the Elevon, make special note to line up the profile of the horn with the profile of the hinge slot as shown.

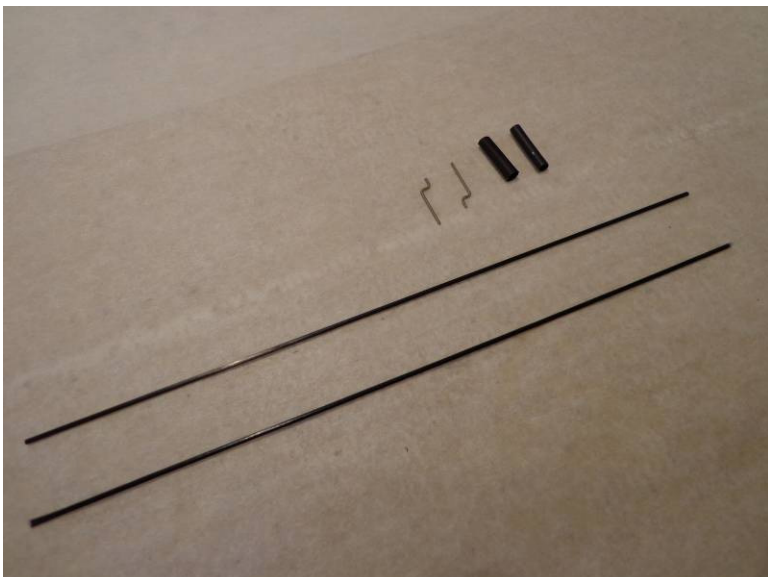


Wipe off any excess glue.

Repeat for the other Elevon.

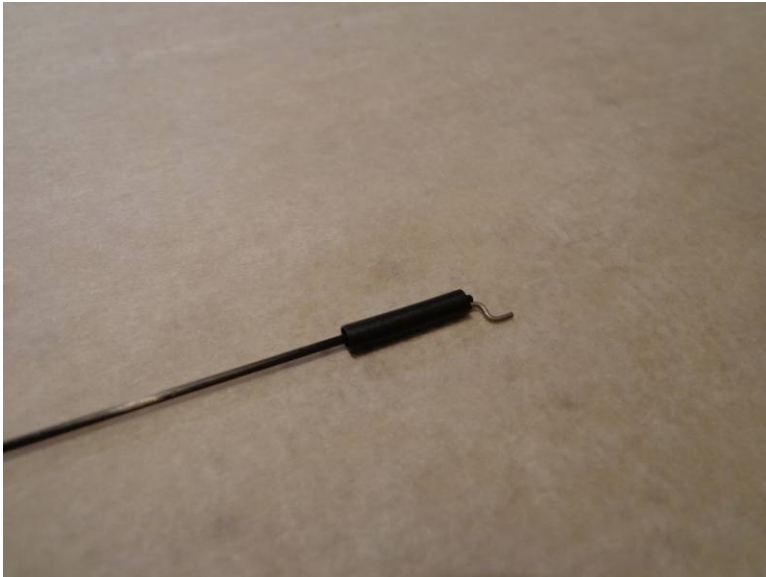


Let everything dry. Apply weights to help keep things flat.

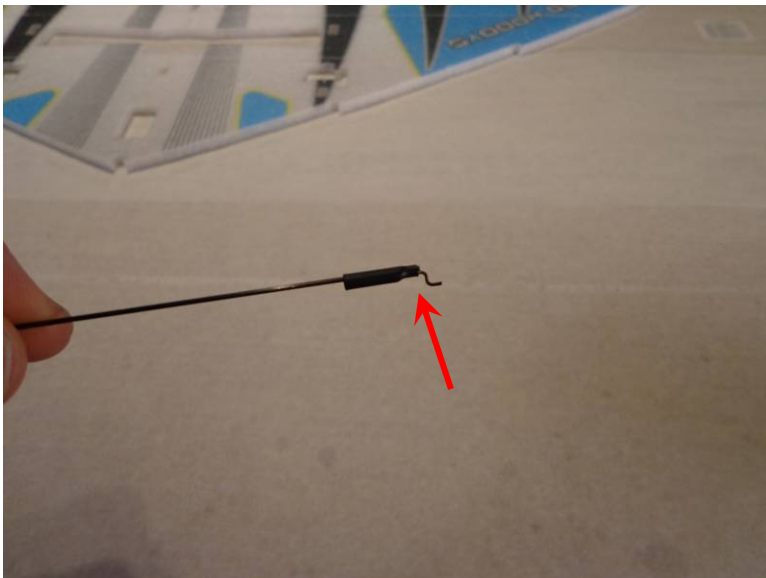


STEP 4

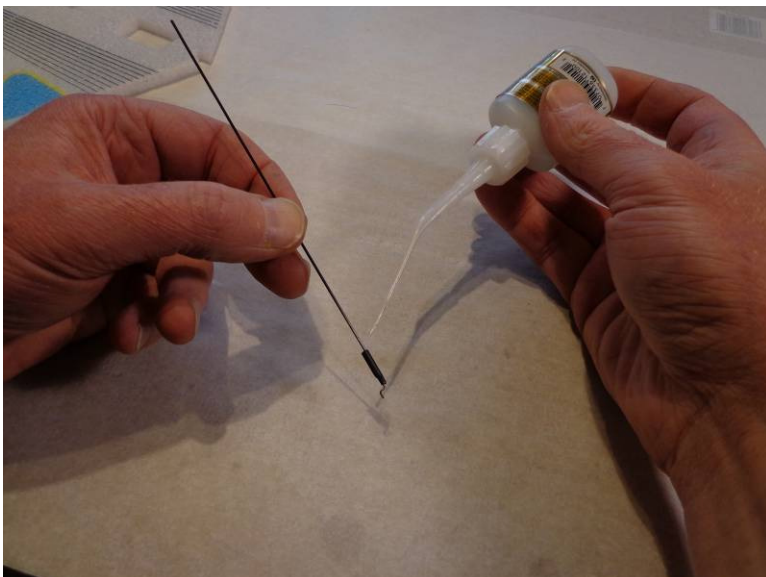
Locate the items shown.



Slide the z-bend and shrink tubing onto one of the carbon push rods



Heat shrink the very end only.

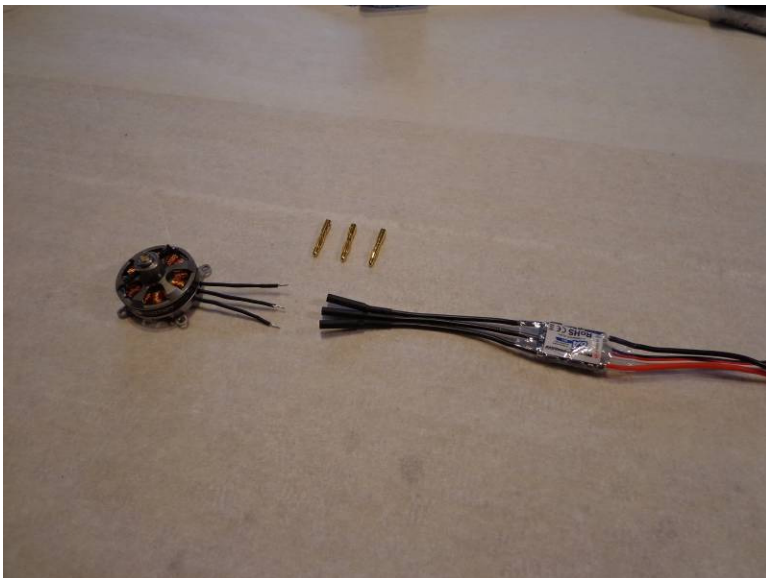


Apply a few drops of CA down the open end of the heat shrink tubing.



Shrink the tube completely. Apply heat carefully and blot away any CA that is forced out, onto a paper towel. If the glue catches fire remove the lighter and blow out.

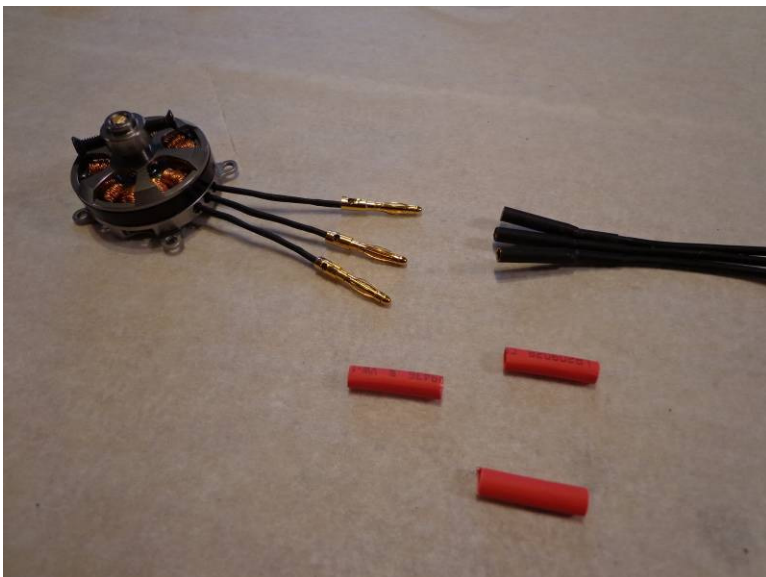
Repeat for the other control rod.



PREPARE THE ELECTRONICS

If your motor did not come with 2mm bullets,, add them now. **Also note that your power combo may have come with a different motor, same instructions apply.**

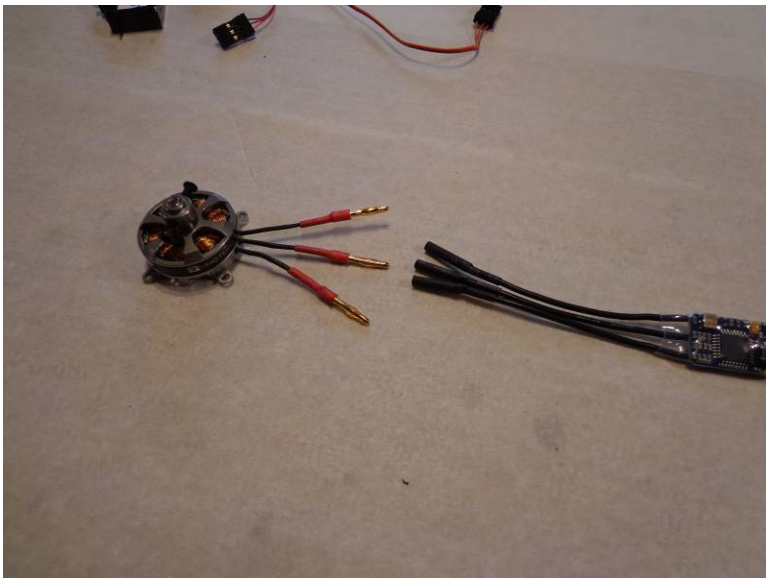
As an option: you can solder the motor leads directly to the ESC. If choosing this option, female plugs from the ESC would be removed and wire insulation stripped back. Solder and protect with a single piece of heat shrink tubing on each wire



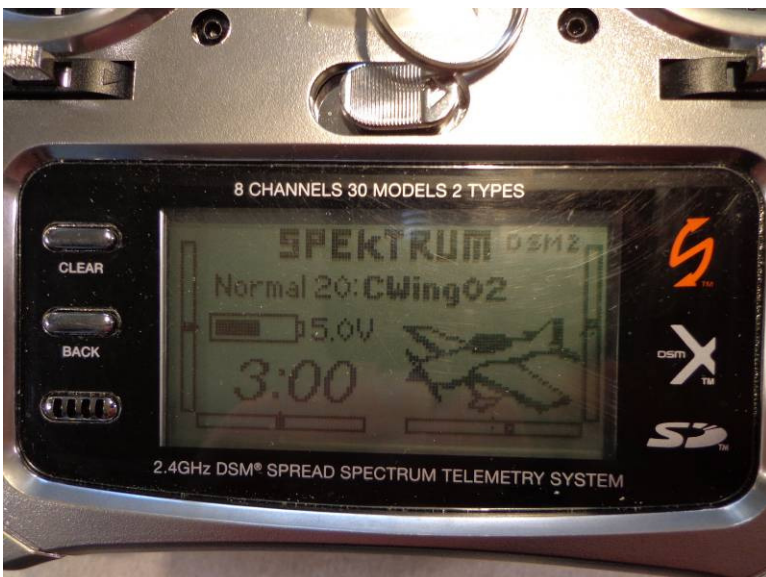
Solder them on and prepare 3 small pieces of shrink tubing



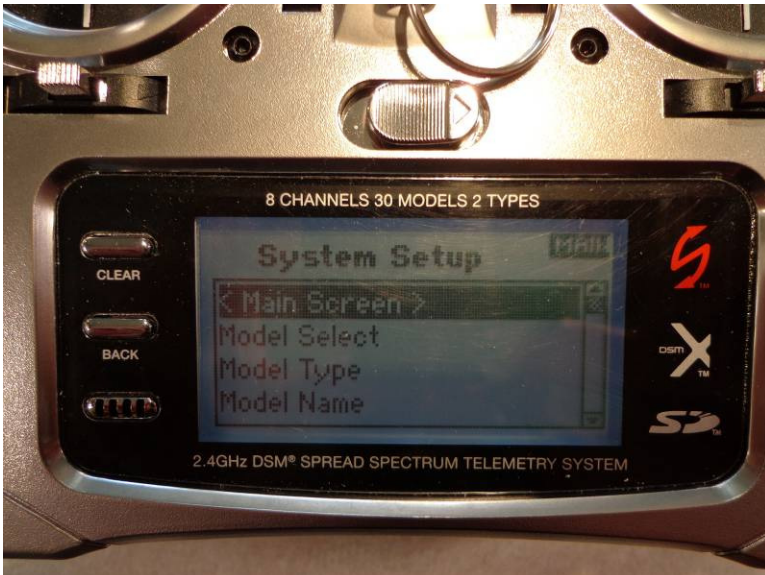
Shrink the tubing.



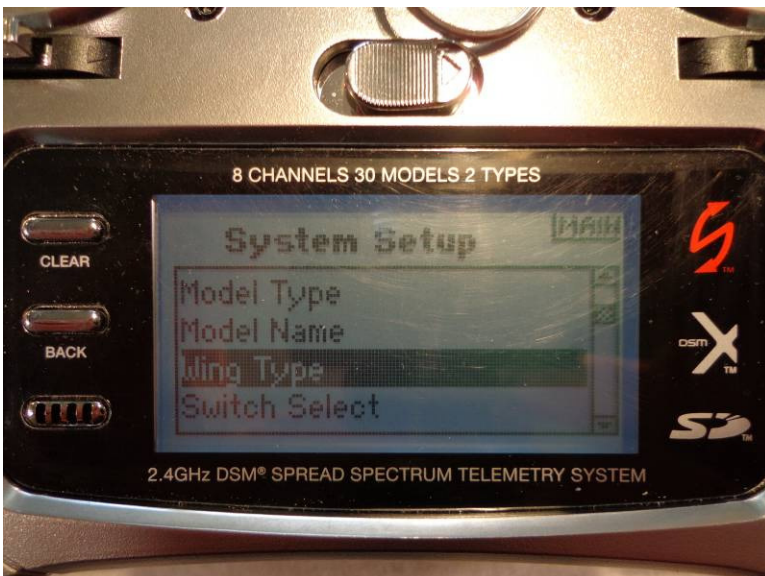
Motor ready to connect to the ESC



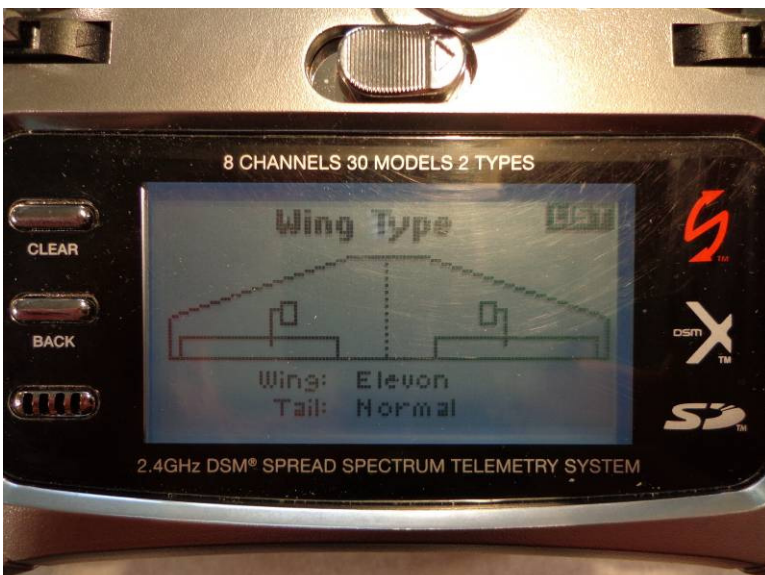
Set up a new program on your Radio, in this case the model has been named "Cwing02"



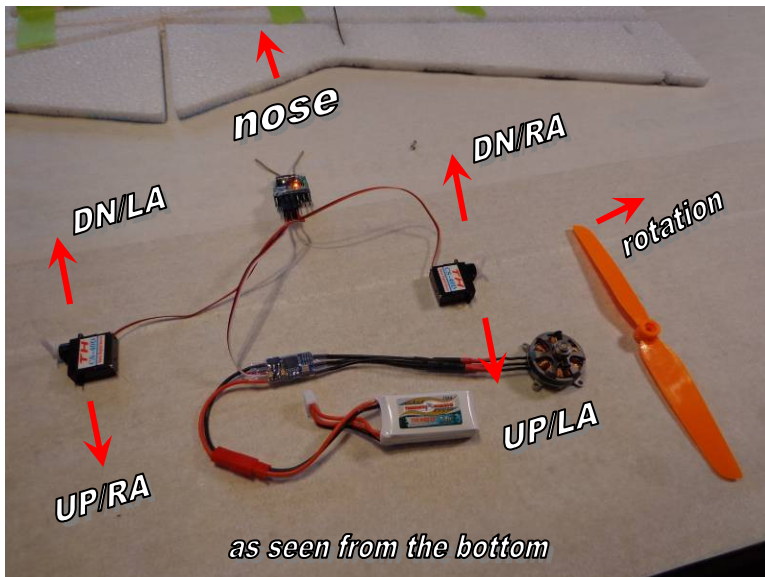
Go to your System Setup Page.



Go to the menu for Wing Type selection.

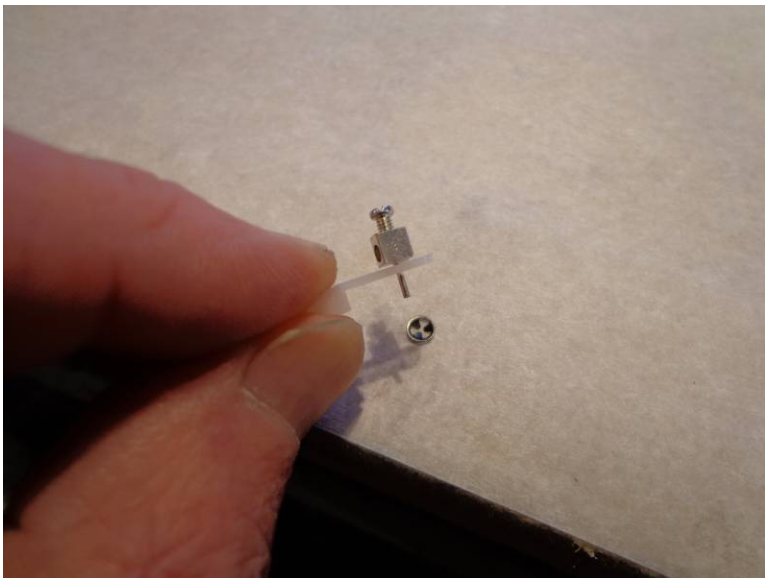


Pick "Elevon" for the Wing Type

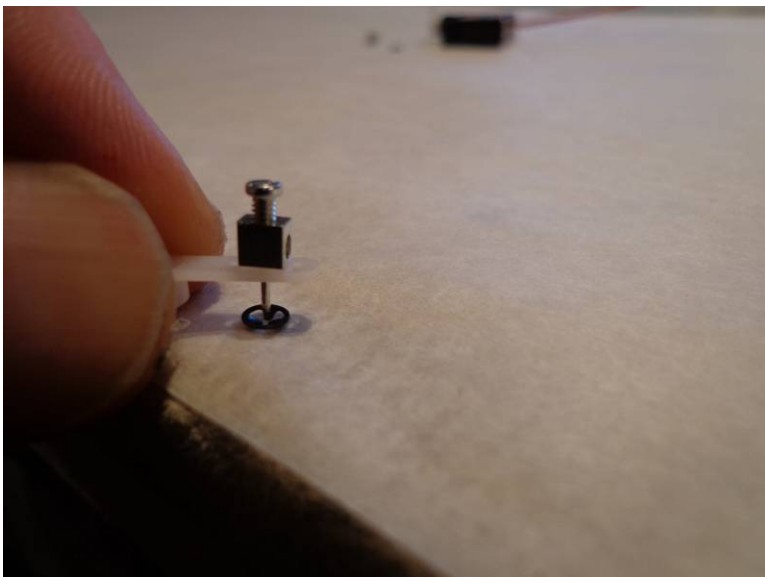


Bind your Radio to the Receiver, center all trims, set up the proper direction and controls for the Elevons, set sub trims so servos arms are 90 degrees to the servo and determine correct motor rotation.

NOTE: if you chose to solder your motor wires to the ESC you can change the motor direction via the transmitter programming method.

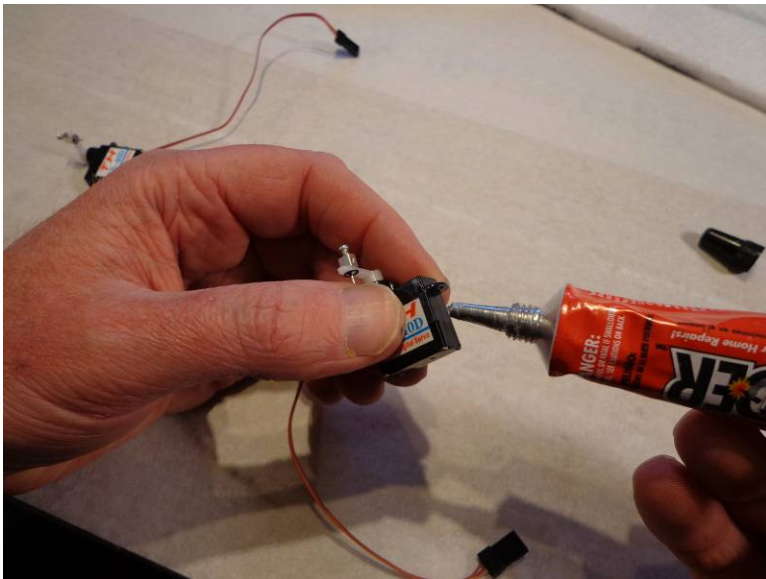


Attach the quick link to the Servo arms. For the arms included with the Twisted Hobbys CS-40D, use one hole in for mild control (shown) and outer most hole for extreme control



On a piece of cardboard or other soft surface push the pin onto the keeper.

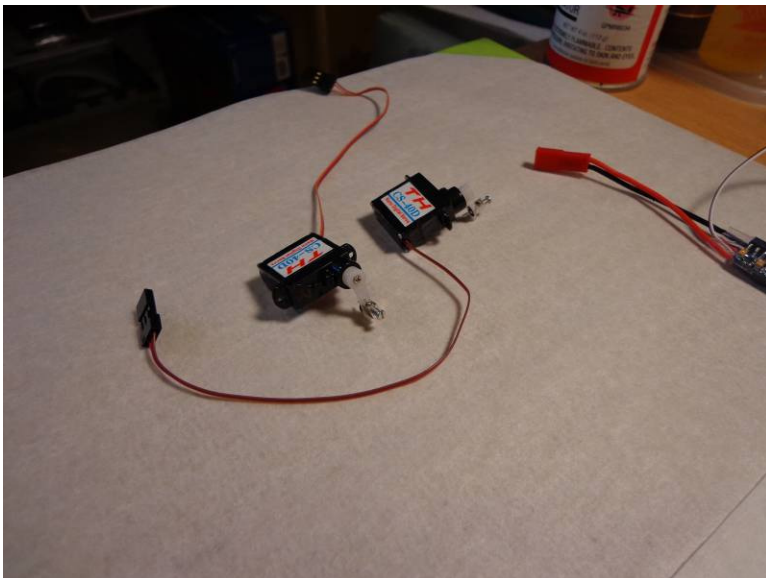
NOTE: the concaved side is UP in this picture.



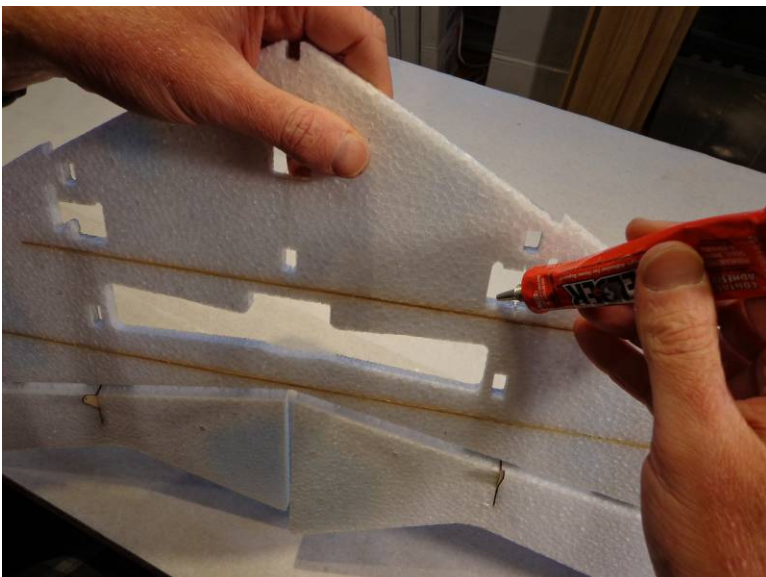
PREPARE SERVOS

Add thin (skim) layer of Welders to the three sides of the Servos that come into contact with the surfaces of the cutouts in the wing.

NOTE: The method being described will allow for removal of the servos yet hold them tight otherwise.



Set the servos aside to allow the skim coating of Welder to dry thoroughly, you should allow a couple hours for this, longer if possible.

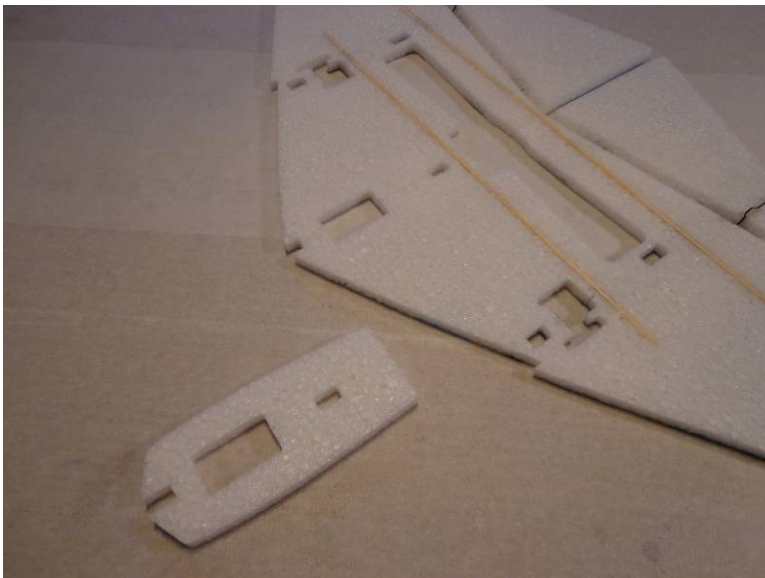


Put a small bead of Welders on the matching surfaces of the wing cutouts.



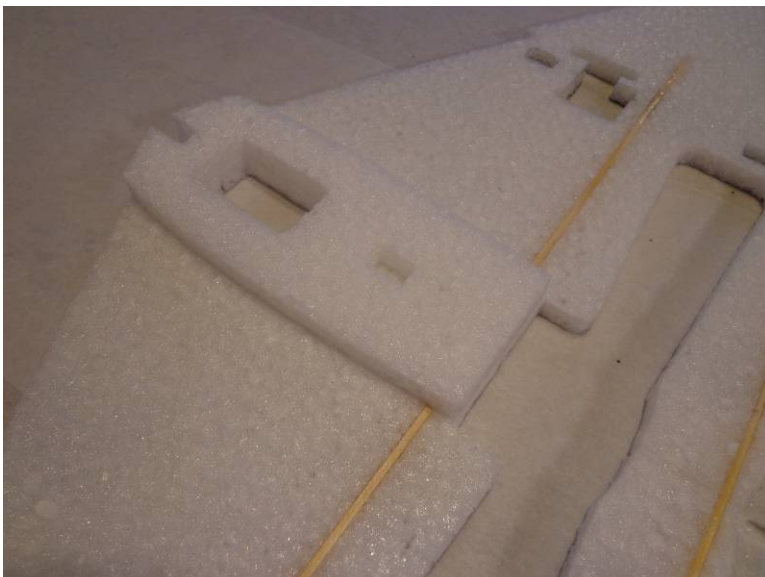
Smooth the glue out to a thin coat and allow to dry a couple hours, longer if possible.

NOTE: Once the glue has dried, there will still be a “sticky” surface between the servos and wing cut out, hold them securely in place, but still remove-able if needed

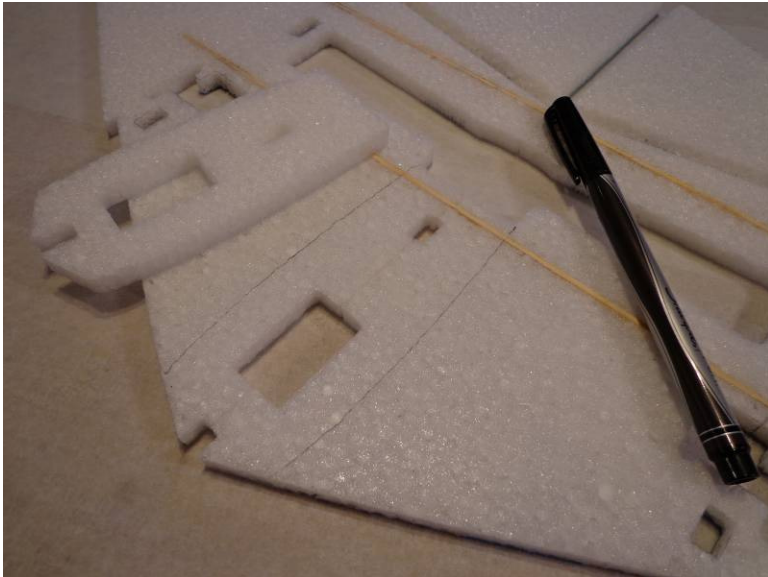


STEP 5

Locate the lower fuselage doubler



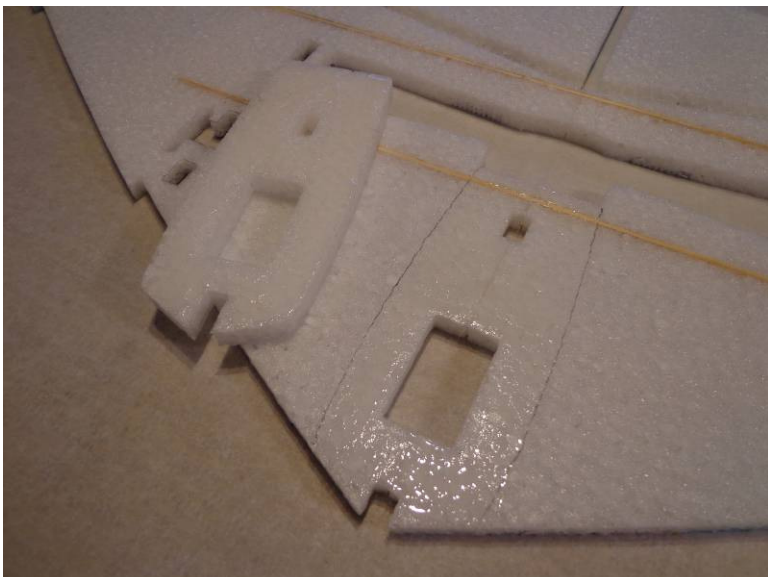
Position it as shown. The back edge but be flush with the cutout in the wing. This edge forms one of the motor mount surfaces, making it flush will ensure a nice flat surface for the motor mount to fasten to later.



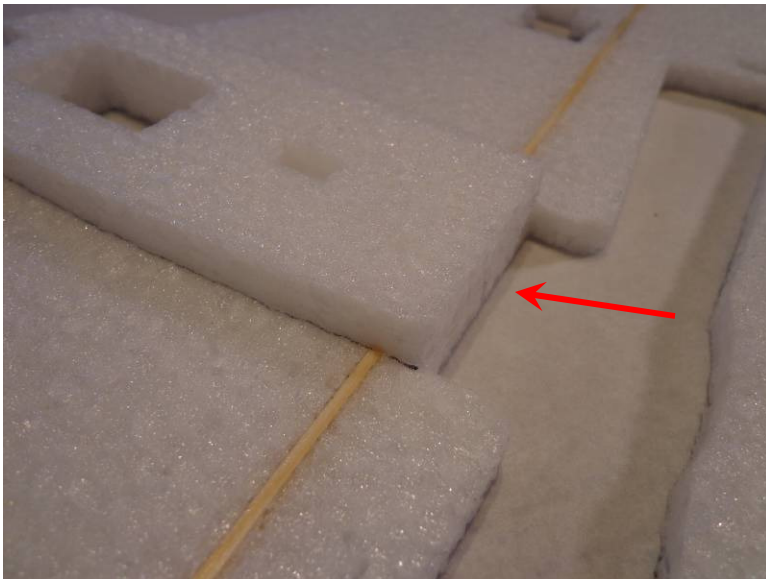
Trace the location of the doubler



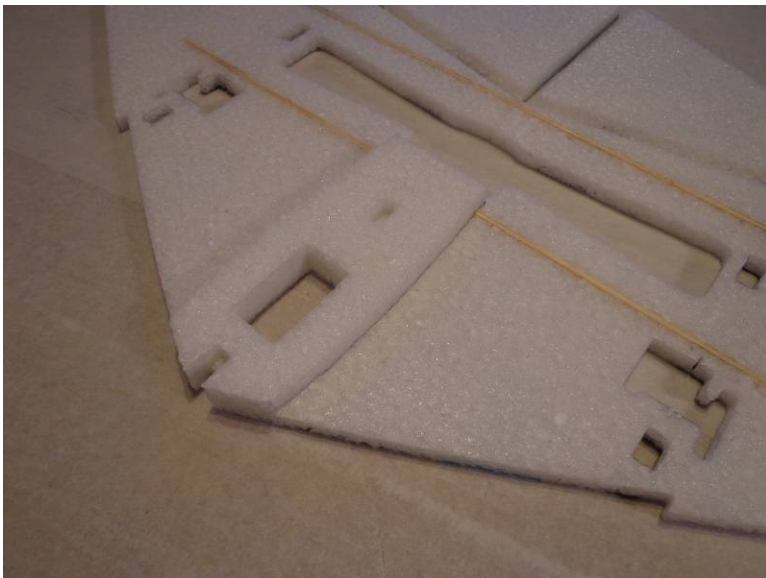
Coat each surface with a thin coat of Welders



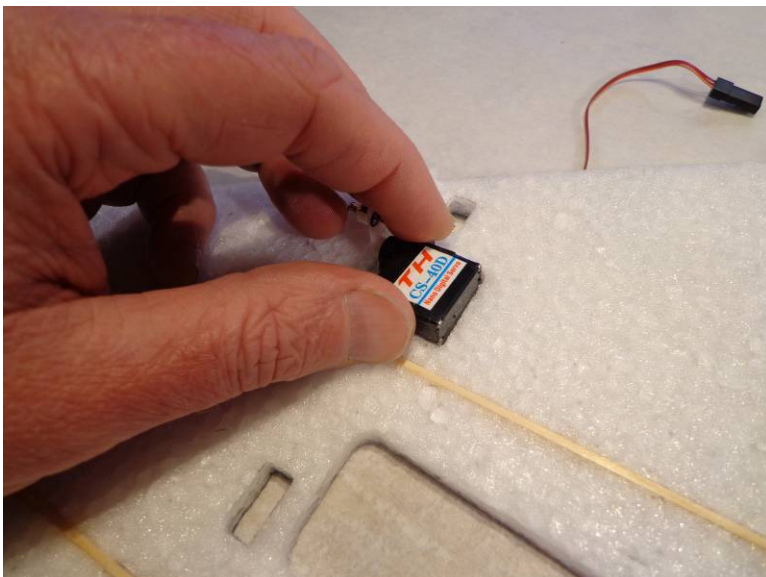
Allow the glue to tack up.



Bring the two piece together, remembering to keep the back edges flush.

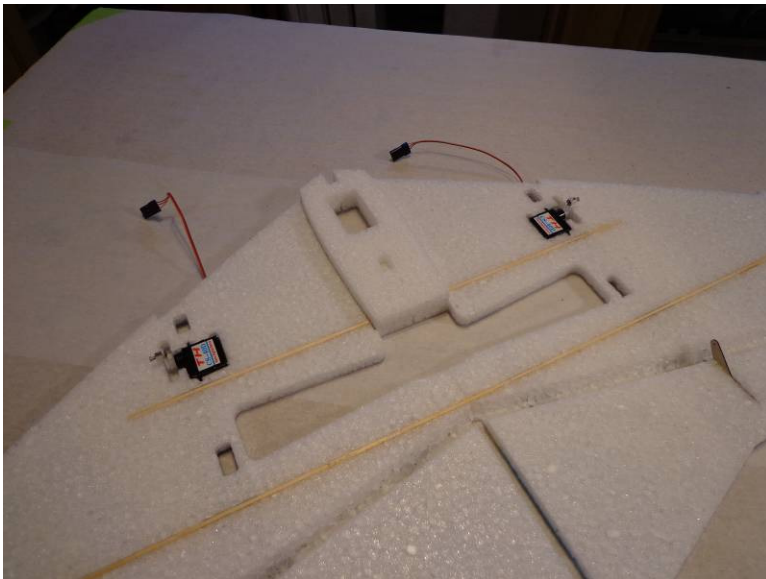


Completed assembly.

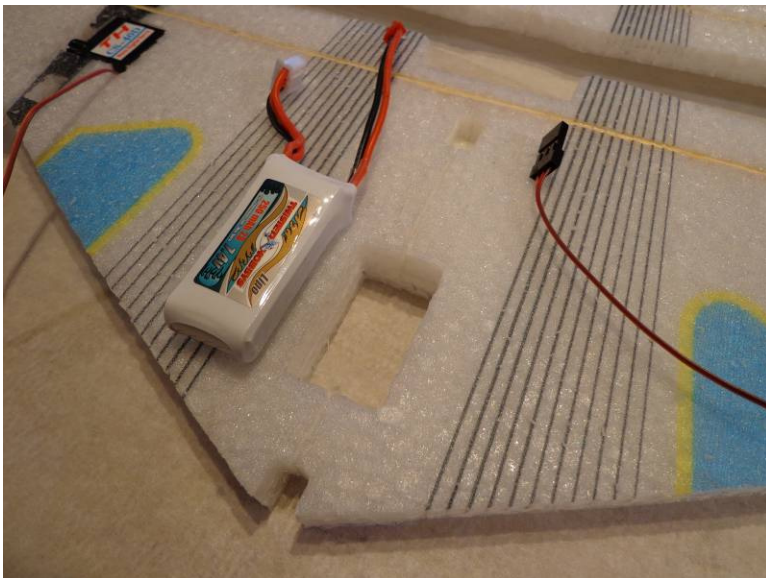


If the glue on the servos and wing has dried, you can now install them into the wing cutouts. Servo horns should be sticking out on the bottom side.

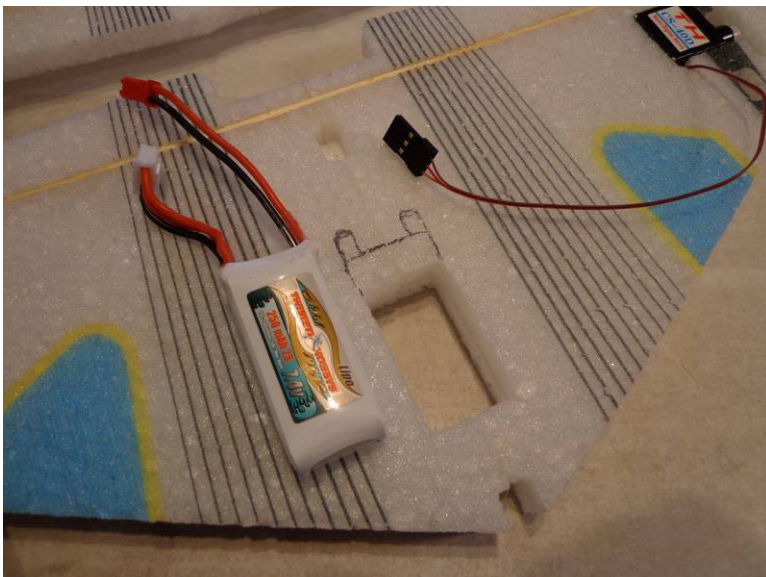
NOTE: Install these in the same positions as when you did your initial radio setup earlier in the build.



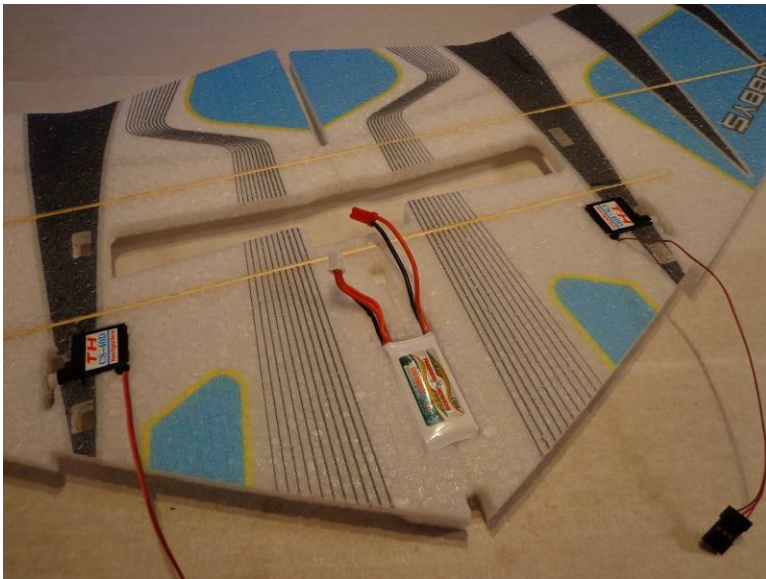
Both Servos in position



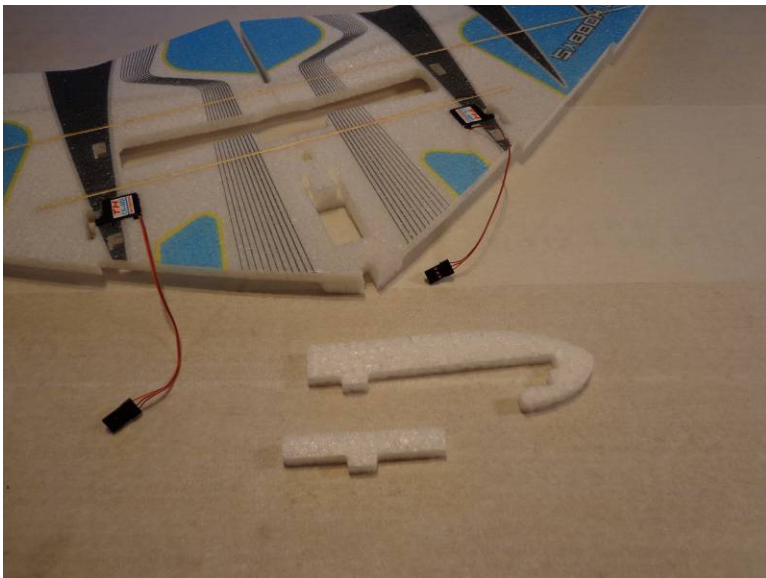
Decide what batteries you will be using.



Mark as required for the foam that needs to be removed.



Remove the material as marked and test fit the battery

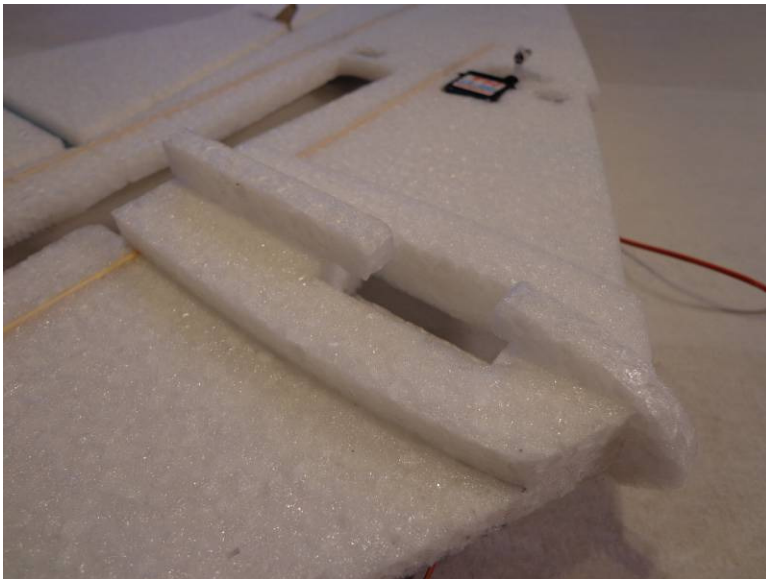


STEP 6

Locate the upper and lower center ribs.

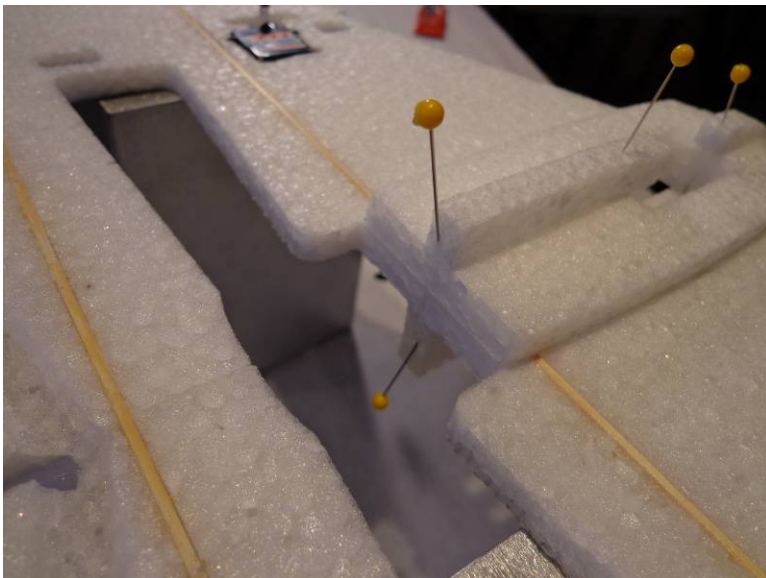


Test fit the upper rib, making sure that the back edge lines up with the cut out in the wing.



Test fit the lower rear rib.

NOTE: This part is NOT symmetrical make sure it is orientation is such that the back edge lines up with the cut out in the wing.



Glue all the pieces together (wet) and secure with pins or tap. Allow to dry.



Locate the motor mount



With the edge of a file or coarse sand paper, rough up one side of the motor mount



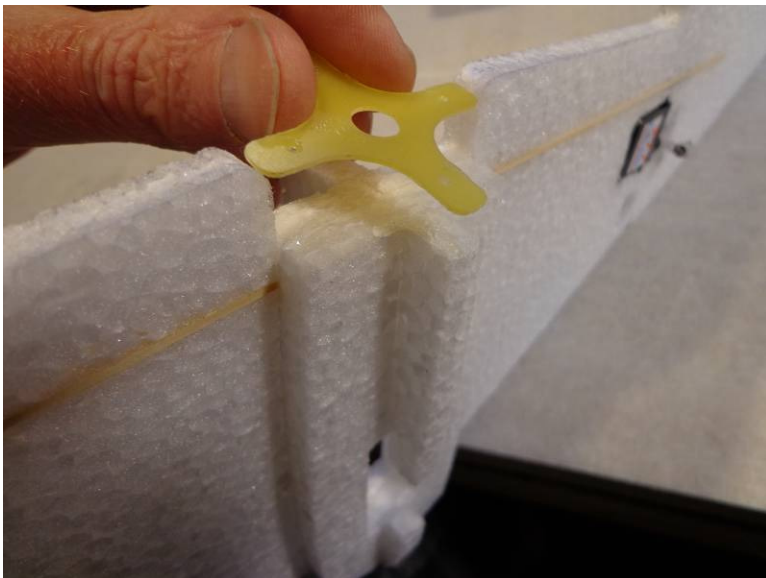
Roughed up and ready for glue.



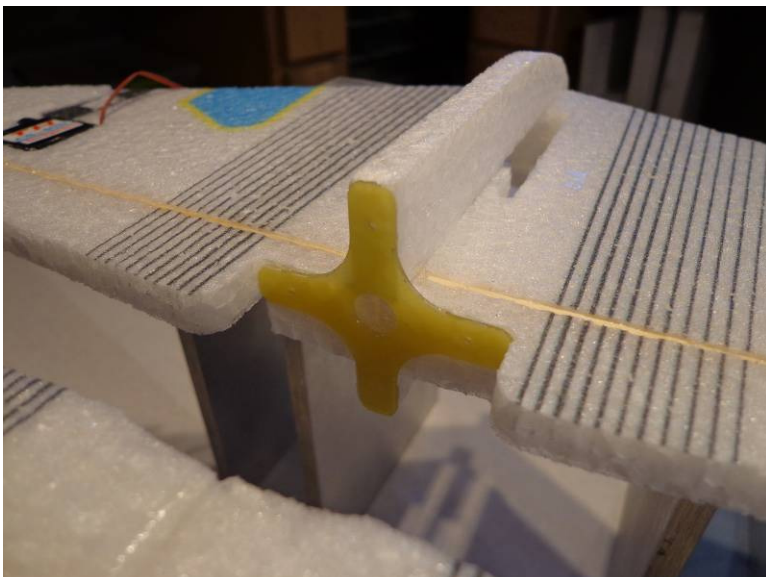
Coat the roughed up side with Welders, and allow to tack up



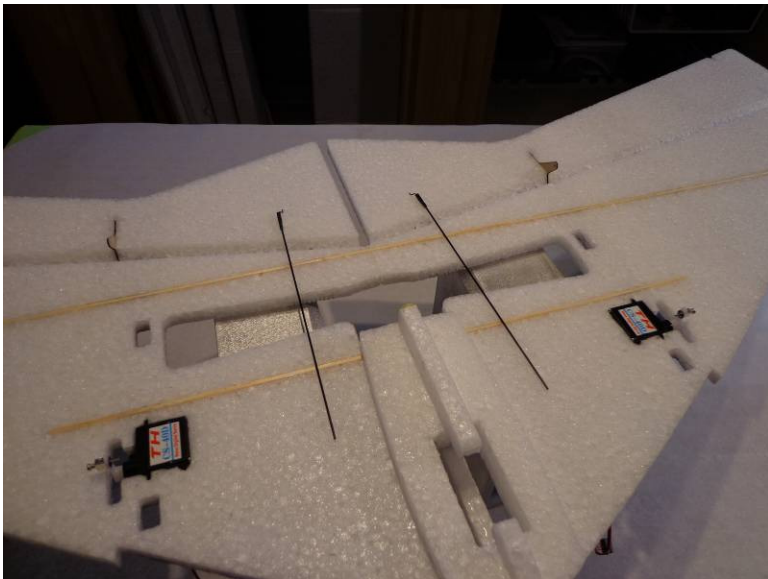
Coat the mating surface for the motor mount on the fuselage with Welders, and allow to tack up.



Once the glue has tacked up, assemble the two pieces.



Motor mount installed and ready for the motor to be installed.



STEP 7

Locate the push rods that were assembled with ends earlier



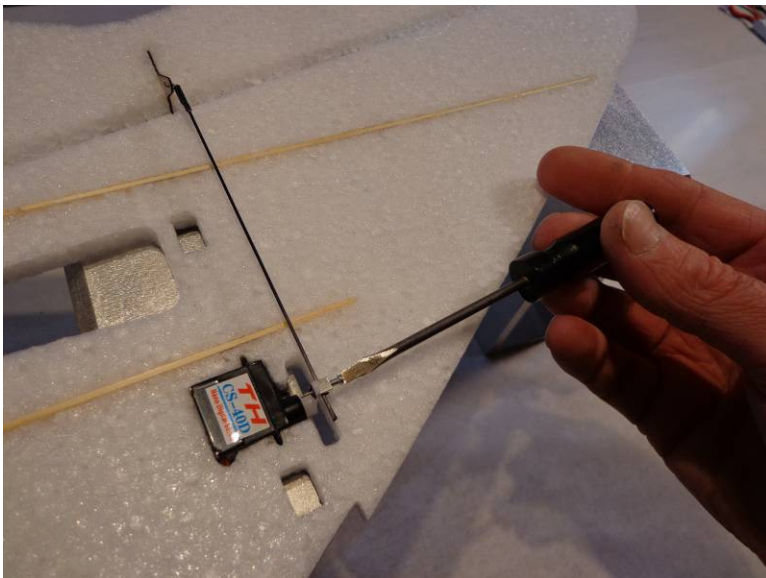
Install the z-bend end into the Elevon Horn.



With the Elevon in it's neutral position, rough cut the push rod to approx. $\frac{1}{4}$ inch beyond the quick link.



Push back the Elevon and slide the cut end of the push rod thru the quick link. It may be necessary to cut the rod a little shorter.

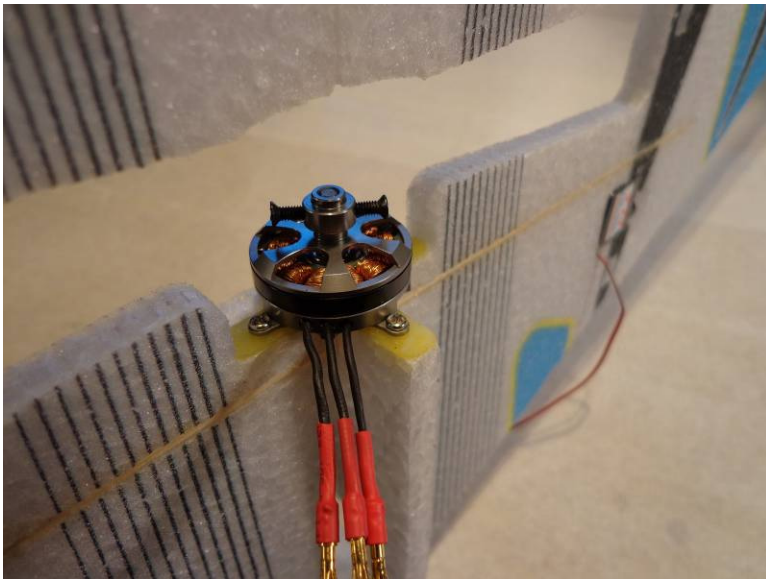


Lightly tighten the set screw.

NOTE: Over tightening will crush the carbon rod and ruin your push rod.



Repeat for the other side.

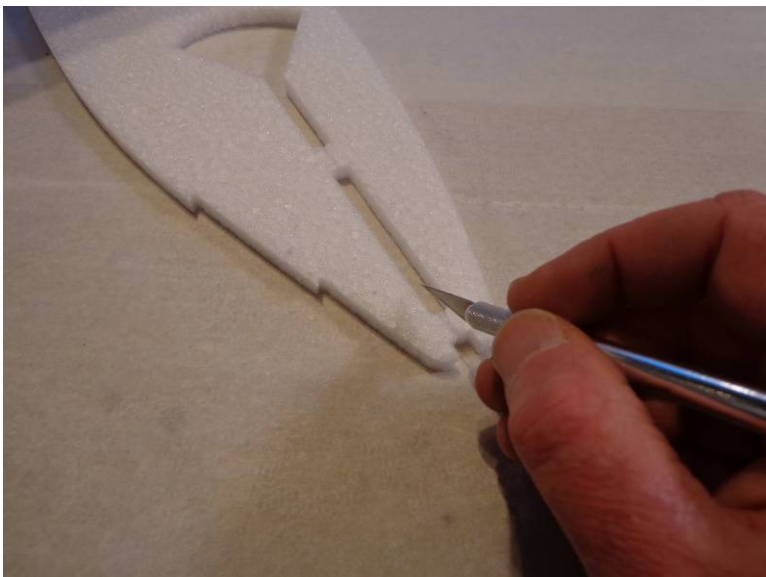


Mount the motor... situate so the cables come out in the area where you want to install the ESC.

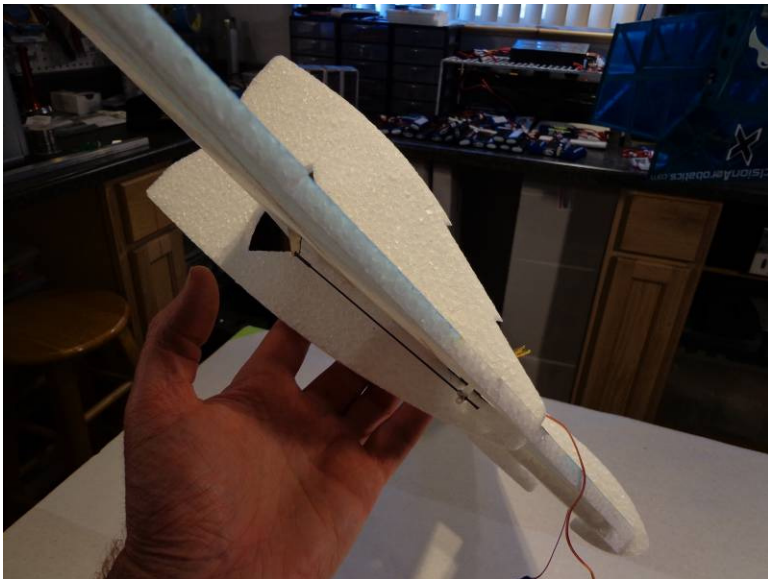
Note: motor shown may be different than the one included in your power combo.



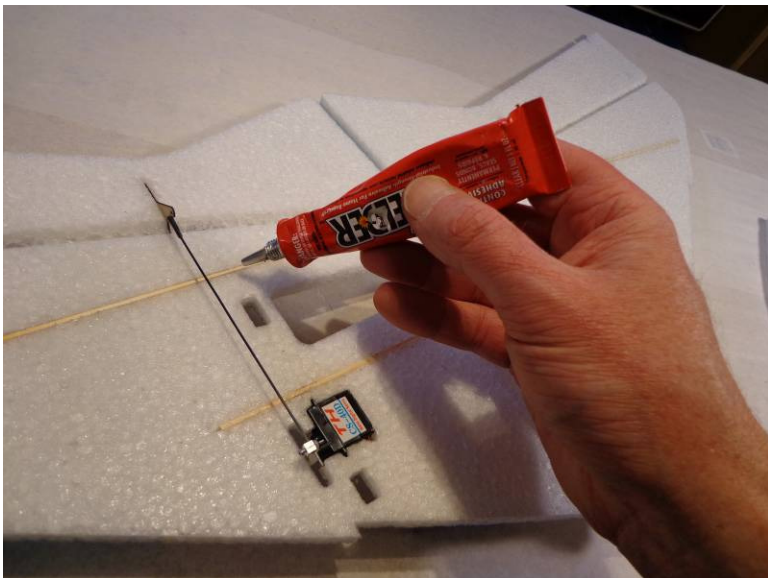
Slit the Side Force Generators in prep for assembly to the Elevon.



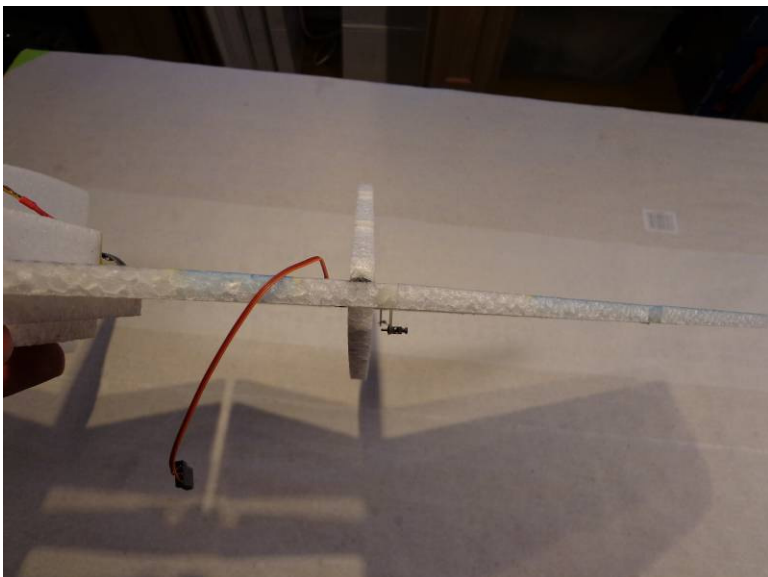
Do the same for both Rudders. Slit in two places



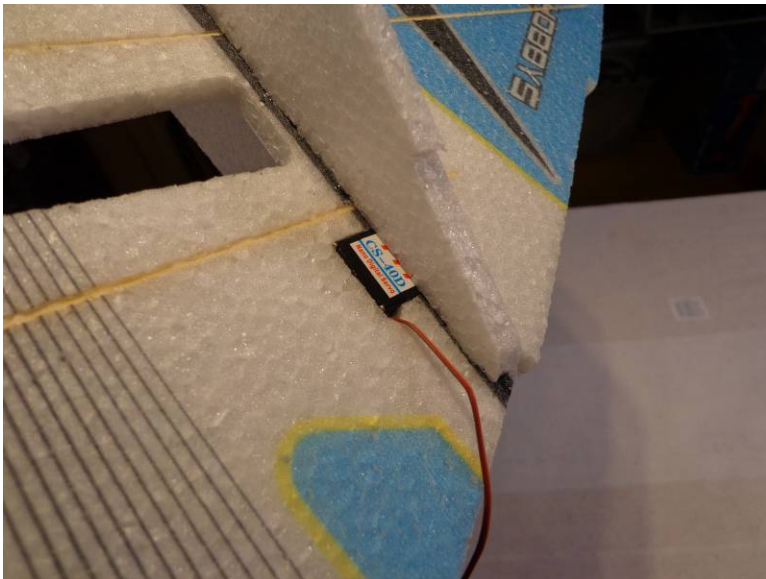
Test fit noting that the larger surface area is the top of the rudder.



Lay down a bead of Welders on both sides of the wing in the area that comes into contact with the rudder. Avoid the area directly around the servo, this will make it easier to remove should it fail.



Spread the rudder and slide onto the wing from the back side. Align with the tabs and press together. Make sure that the rudder is 90 degrees to the wing. The glue will tack pretty quickly, but until it does make there are no gaps.



The glue will tack pretty quickly, but until it does, make there are no gaps.



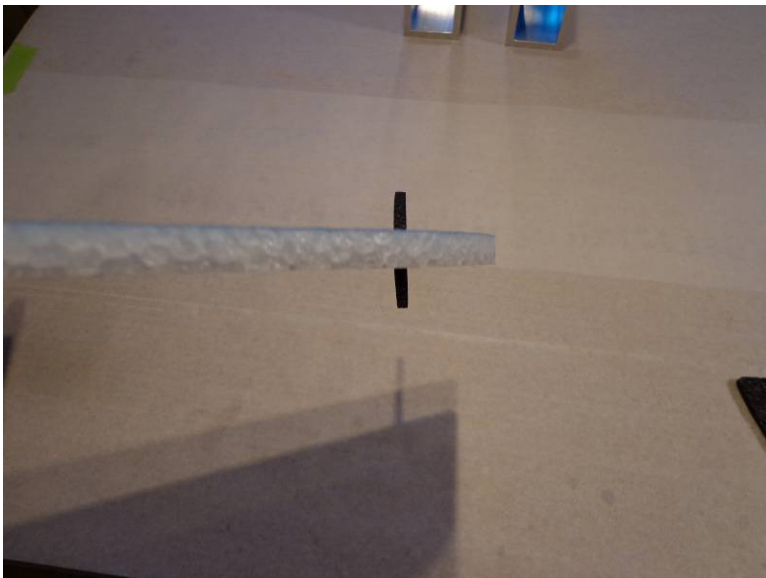
Repeat the process for the SFG's.



Test fit.



Apply a small bead of Welders in the are the SFG will contact.



Install the SFG and check for squareness.

Repeat for the other side.

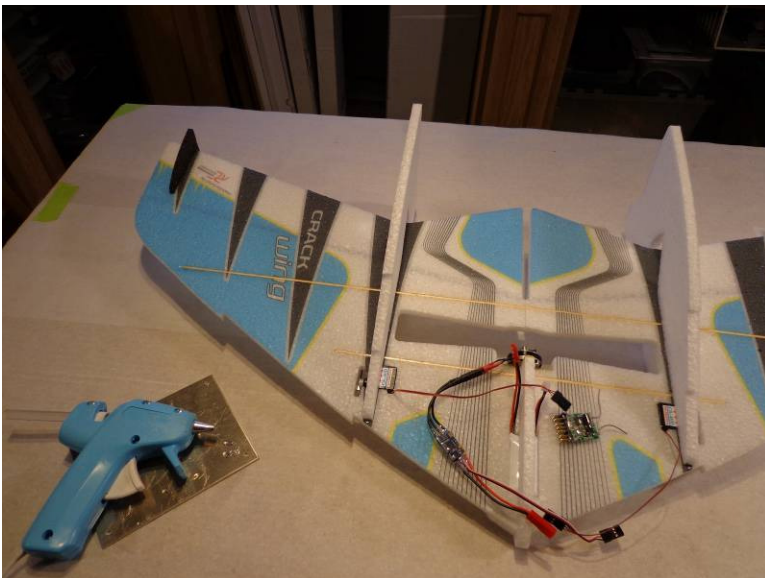


Make note of where the Center of Gravity should be located.

C.G. = 13mm
back from front spar

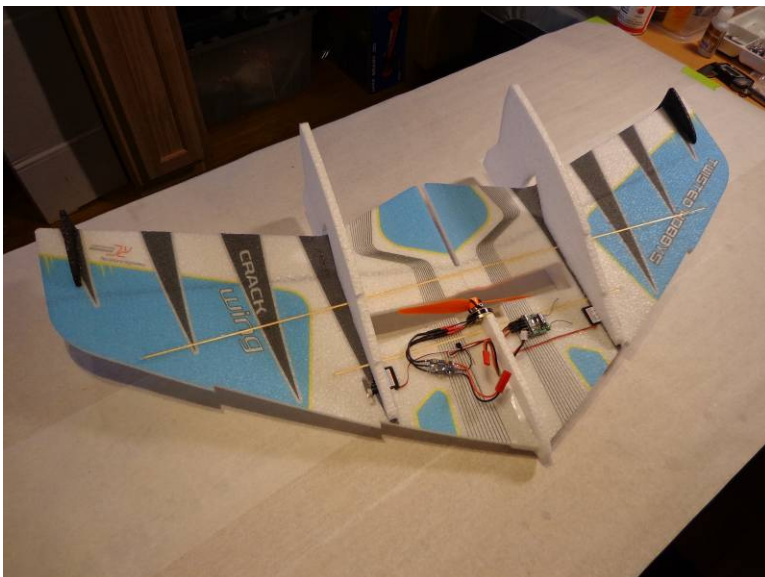


Since the battery is in a fixed position on this plane, you will need to balance by locating the ESC and Receiver appropriately.

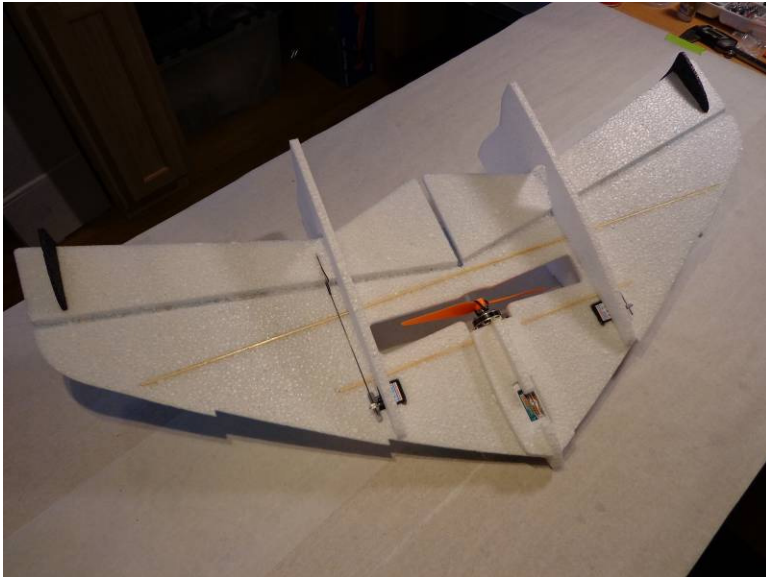


Move the components around until the plane balances 13mm back from the front spar.

Note: CG range on Flying wings is much narrower than on conventional planes, take your time and get this as close as you can to the recommended spot.

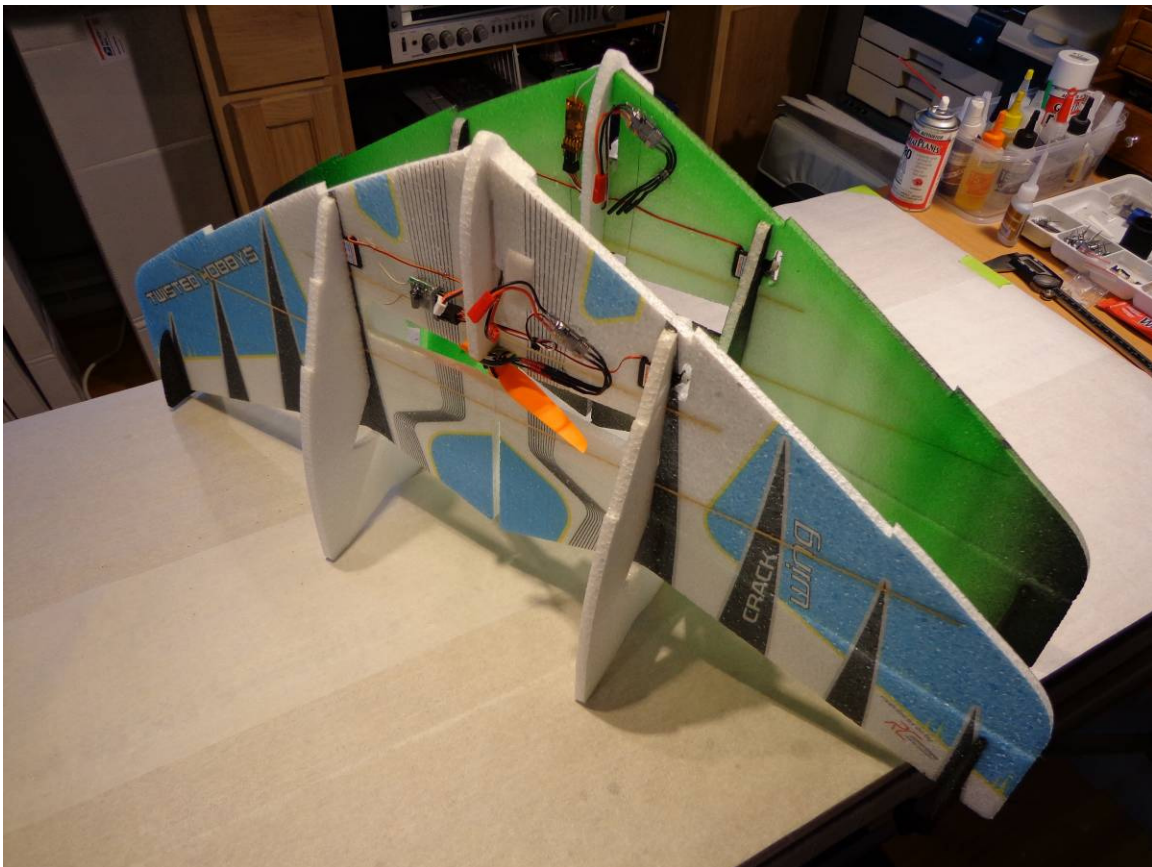


If using all the Twisted Hobbys' stuff, and the 250mAh Twisted Hobbys' LiPo battery, your ESC and Receiver should be located approx as shown in regards to the front to back position. Placement from side to side is not as critical, but you should keep lateral balance in mind. You could also mount all your gear on the bottom side if desired.



Bottom side. For this build we chose to keep all the electronics on the top in order to keep them safe during landings.

..... READY SET GO!



ENJOY!

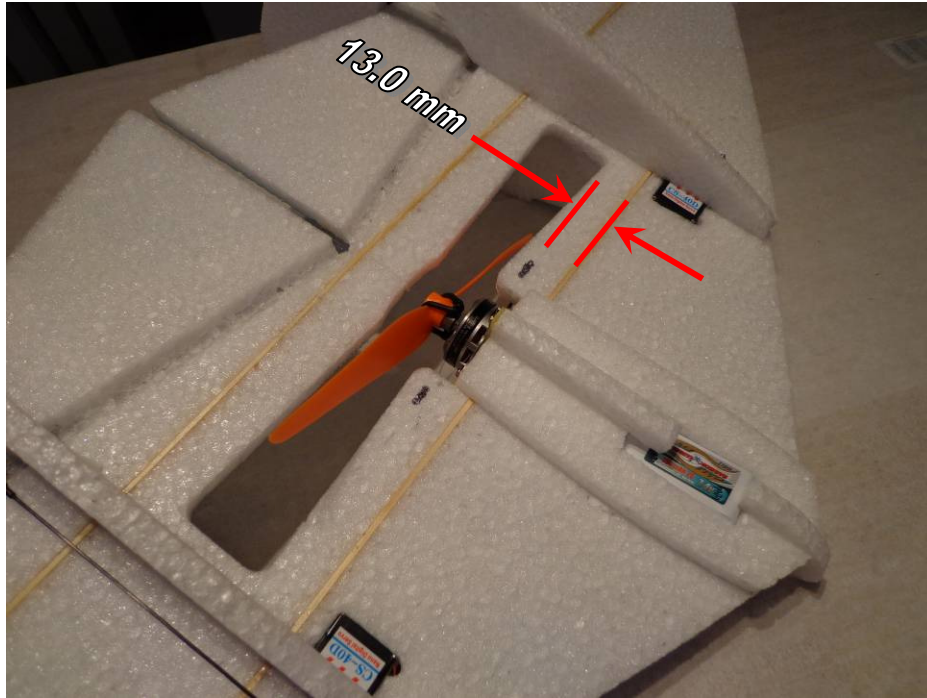


CENTER OF GRAVITY

13mm back from Forward Spar

Locate the electronics to establish the proper Center of Gravity.

CG point is 13mm back from the Forward Spar. For flying wings it is important for the location of the CG to be very accurate the acceptable range is very narrow.



CONTROL THROWS

3D / Combat Flight:

Max Allowed as determined by Rudder Cut-Outs – SEE PICTURES BELOW
60 to 75% expo

Sport:

20 degrees all surfaces
30 to 45% expo

Depending on your Radio the Elevon mix / setting may “overdrive” the controls surfaces. **It is very important to determine the max travel while the transmitter sticks are in the extreme corners of the Gimble.** Individual Elevator and individual Aileron control will not be close to the limits at all, so do not set the max travel for the individual channels in this manner. Failure to set the limits as a COMBINED CONTROL could result in damage to the servos.



FULL UP



FULL UP & LEFT

As shown above “Full Up” does not reach the limits established by the cut out in the rudder fin. However in the “Full Up & Left” situation the Elevon is set to just bottom out at the position of the cut out. Care must be taken when programming as to not overdrive the servos. If you are unsure of the travel loosen the screw in the quick link and experiment with your radios programming until you are satisfied that it will not overdrive the control surface.

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: Should be centered 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.

Flight Testing

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 Wing is a 3D capable EPP plane and will take anything you throw at it, including the occasional crash. If, as the result of a crash, the foam tears, simple 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 the perfect size for a friendly game of combat at the neighbor park or smaller flying field, allowing for plenty of opportunity to shoot your foe down. It is also great stand alone plane for simple fun and R/C pleasure.

Storage

This EPP plane should be stored on its fins in the Vertical Take-off position, doing otherwise could cause the airframe to twist. Storage in a hot car could also cause damage.

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

NOTES & S/U SHEET

Setup Sheet

Transmitter -

Receiver -

Model

Weight - g oz

CG Point - mm from wing leading edge

timer - min

Travels and Exponential

	low rate	high / 3D
right aileron up -	<input type="text"/>	<input type="text"/>
right aileron down -	<input type="text"/>	<input type="text"/>
left aileron up -	<input type="text"/>	<input type="text"/>
left aileron down -	<input type="text"/>	<input type="text"/>
aileron expo -	<input type="text"/>	<input type="text"/>
rudder right -	<input type="text"/>	<input type="text"/>
rudder left -	<input type="text"/>	<input type="text"/>
rudder expo -	<input type="text"/>	<input type="text"/>
elevator up -	<input type="text"/>	<input type="text"/>
elevator down -	<input type="text"/>	<input type="text"/>
elevator expo -	<input type="text"/>	<input type="text"/>

Electronic Components

Aileron Servo -

Rudder Servo -

Elevator Servo -

Battery -

motor -

ESC -

Propeller -

TIPS AND TRICKS

- A good building surface is “drop ceiling” panel from a local hardware store on a nice flat board
- use parchment paper between the areas being glued and your work surface
- heavy flat objects (like books, batteries, etc.) could be used to hold everything flat
- When resetting your radio, start with all the ATV's or throw volumes at 100%.
- Make sure you have set the direction of the servos correctly before attempting to trim for zero position.
- If possible try the servo horns in different locations to determine which position will require the least amount of sub trim.
- Installing the servo horns in their final location and attaching quick links to the servos may make servo installation much easier later.
- On the Orange Rx, the negative pin is the one closest to the flat side of the circuit board.
- Keep a good supply of sharp knife blades handy when building a foamie airplane.
- Use low temp hot glue for gluing electronics, this will allow for easy removal later if necessary. The low temp hot glue can be “released” by “painting” the glue bead with an alcohol soaked cotton swab a couple times.
- A business card with the corners clipped off can be used as a small square.
- Allowing the Welders glue to set for five minutes before assembly will shorten the tack up time, just be sure if doing it this way that you get the parts into position quickly, as the glue will start to bond on contact. Any joints that you feel are going to require adjustment, it is best to assembly the pieces while the glue is wet.
- The Green (high tack) masking tape works the best when used to clamp things together on an EPP foam airplane.
- When gluing the rudder to the fuselage, stick pins could be used to hold in position if wanting to handle the airframe before it is completely dry
- A rotary tool with a cutting wheel could be used to produce grooves in fiber glass parts instead of coarse sand paper. Use a hatch pattern. This creates more bonding area for the glue.

