manufactured by: RC factory

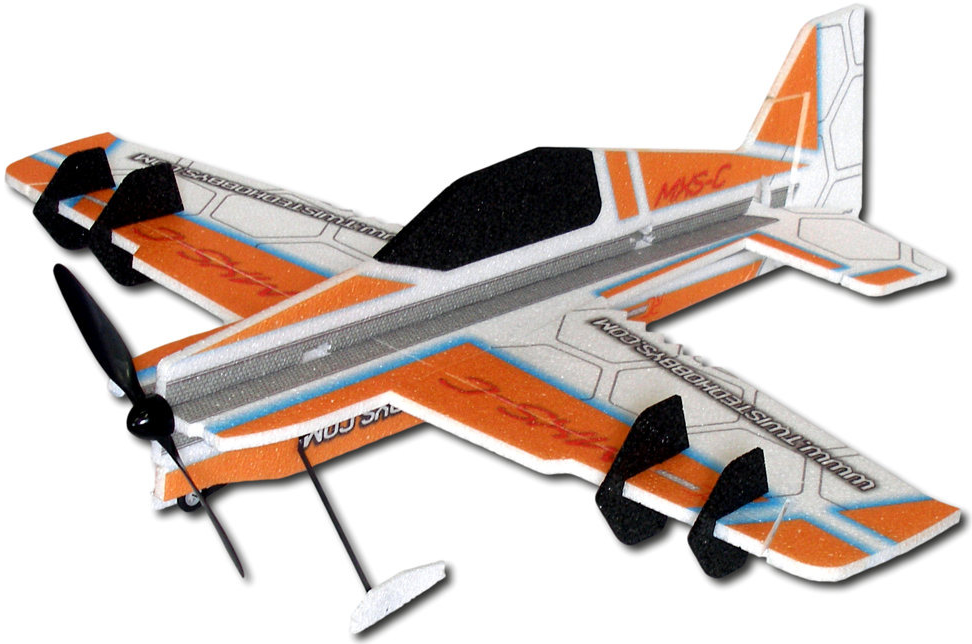
TWISTED HOBBYS

2204 - 2206 Outrunner
10-12 amp ESC
4 channel radio
2x 5g tail servos
1x 9g aileron servo
8 x 4.3 to 9 x 4.7 SF prop
1x 6" servo extension

USA Distributor

Twisted Hobbys

www.twistedhobbys.com



ASSEMBLY MANUAL

MXS-C

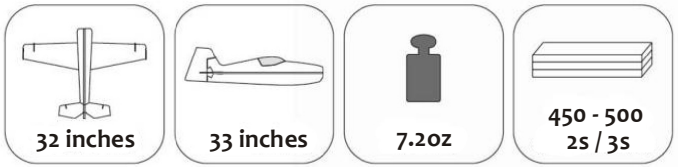


TABLE OF CONTENTS

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 over look the warnings and instructions enclosed or those provided by other manufactures' 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

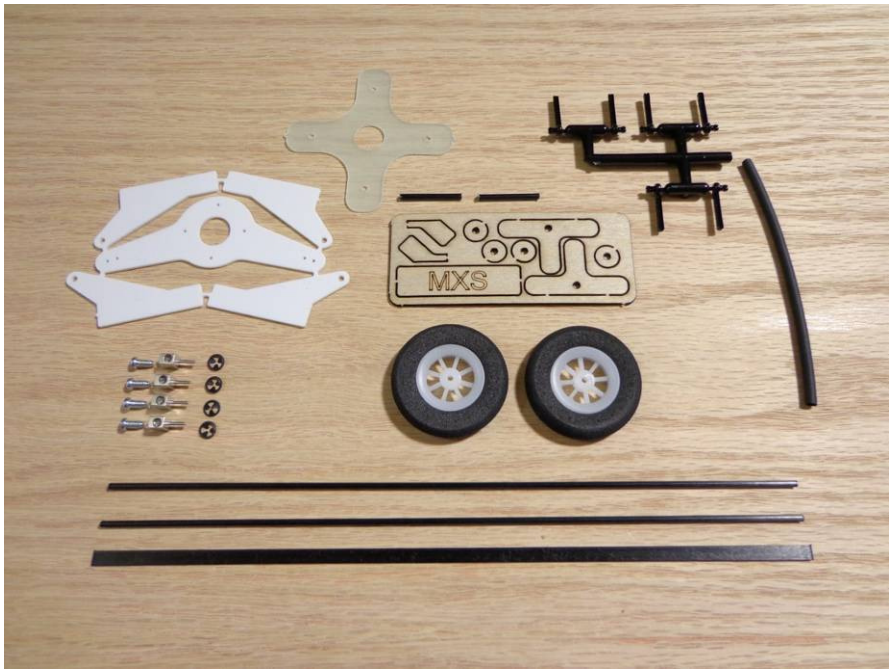
- ✓ Before assembling and flying this model, read carefully any instructions and warnings of other manufacturers for all the products you installed or used on your model, especially radio equipment and power source.
- ✓ Check thoroughly before every flight that the airplanes' components are in good shape 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

PARTS LIST



AIRFRAME COMPONENTS

1x Wing (2pcs)
1x Vert. Fuse
1x Upper Horz. Fuse
1x Lower Horz. Fuse
1x Elevator
1x Rudder
2x Wing Tip SFG
2x Inboard SFG
1x Canopy
1x Hardware Pack (see detail)
1x Wood Wing Spar
2x Wheel Pant
2x Carbon Tail Push Rods
2x Fuselage Truss
2x Rectangle Carbon LG Strips

DETAIL - HARDWARE PACK

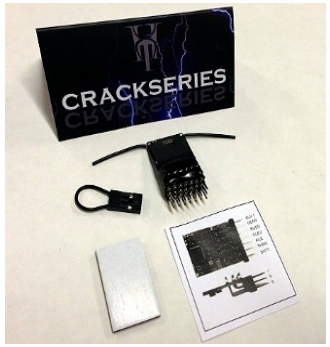
2x Aileron Push Rods
6x Plastic Snap Link Ends
1x Heat Shrink Tubing
1x Elevator Spar
1x Wood LG Set
1x Plastic Control Horn Set
2x Carbon LG Axles
1x Motor Mount Plate
4x Adj. Link End Sets
2x Carbon Aileron Push Rods

OPTIONAL PARTS

Power Combo

(Matched by Twisted Hobbys)

(1) Twisted Motor Works 24g/1420kV
(1) Crack Series 12A ESC
(2) 5g Micro Servos
(1) 9g Micro Servo
(1) 9x4.7 Tuff Prop (2s Set Up)



Specifications

6 Channel / DSM2 / 2.4GHZ
25mm X 19mm X 11mm
Weight: 3.0g / Input: 3.5–9.6V
Bind plug included

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'

Blenderm tape is one of the best know tapes used for hinging and repairing your Depron or Epp models. Each roll consists of 1/2" wide x 4m in length

2 Cell / 450mAh / 5c Charge Rate
Discharge 25c Constant / 50c Burst
JST Connector / Dims. 65x29x11

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

TOOLS & ADHESIVES NEEDED

Tools shown and listed are suggestions only. Depending on your building technique you may not need everything indicated – and/or – you may find that other tools available to yourself may be of benefit to your Build.

It is also recommended that you have a flat building surface, one that will accept stick pins and push pins. An Acrostic Ceiling panel from your local hardware store fits this bill nicely, and will lay flat on your work table. Over size / long push pins are available at your local craft store. These two items are by no means required, but will aid in the building process, and can be used for future projects.

- 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
- Thin & Medium CA
- CA Applicator Tips
- Activator
- Tape Measure and Ruler
- Lighter
- Small drill bits

THE BUILD

BEFORE YOU BEGIN - You will need at least one Servo Extension. Length will vary depending on your components, AND two may be needed if you preference for RX location is near the CG of the airframe.

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.

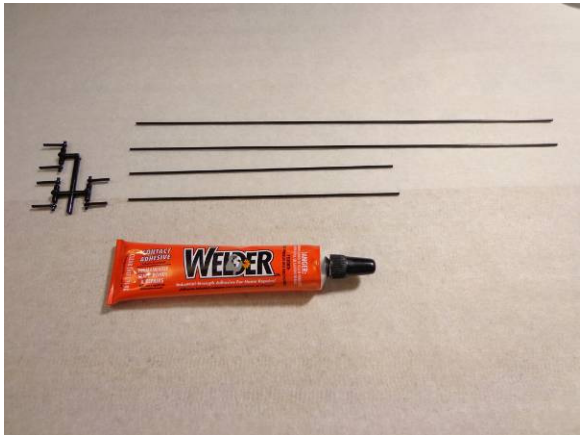
Welders glue is the primary adhesive used for this build. **When using the Welders glue for a butt joint, apply a thin film to each surface, allow to sit for approx five minutes and then assemble.** Note that this method will create a nearly instant bond, so locate carefully when bringing the two pieces together. **If alignment is necessary** or a slip joint, do not allow the glue to tack up, simple 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.

Open up you kit and inspect for damage and / or missing parts. Use the Parts List on page 5 to verify that your kit is complete.

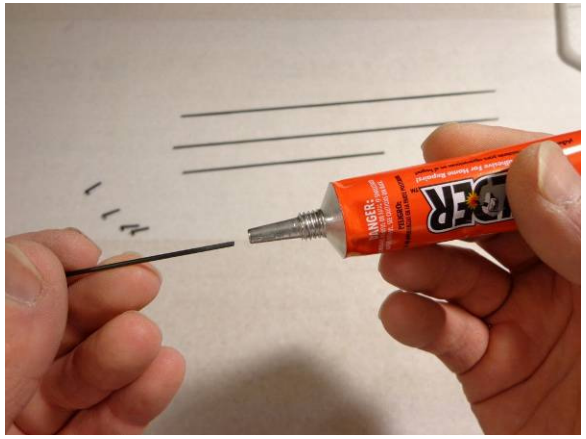
Verify that your power set is complete. Inspect each item for damage.

Plug all the components in and test for proper operation at this time. Faulty items can not be returned after installation.

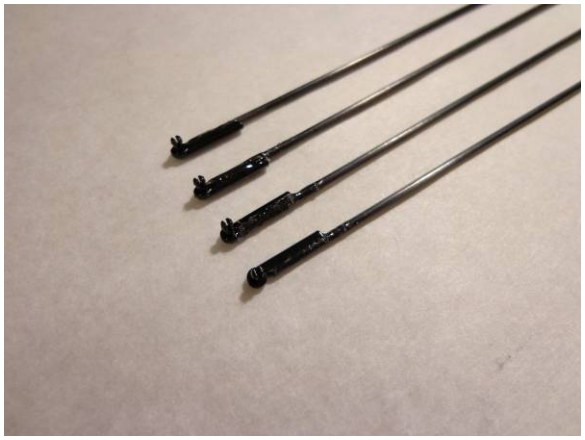
Flex hinges back on themselves and weigh them down for 1 to 12 hours



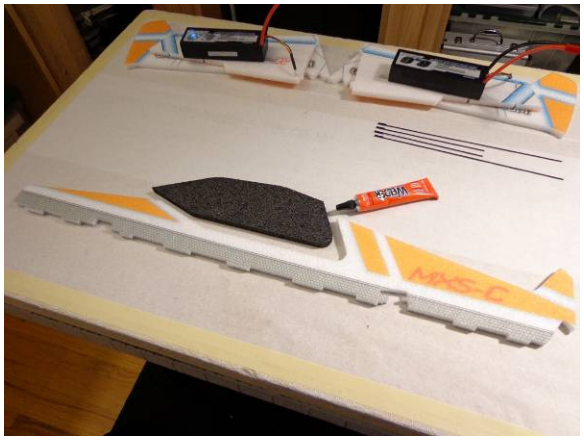
As the hinges flex, glue snap-links to pushrods (since these will take a long time to dry)



Put glue on pushrod by dipping it into the glue nozzle



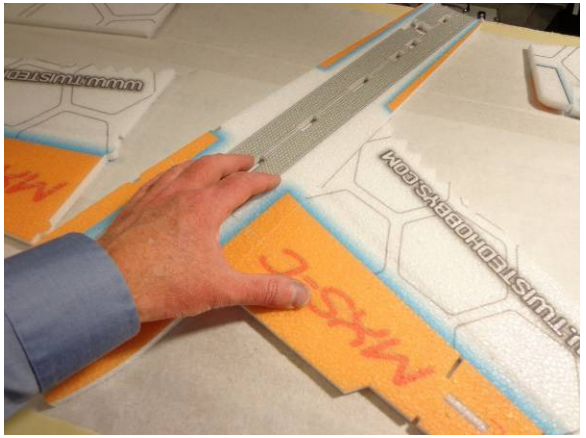
Carefully set pushrod in groove on snap-link, let dry for at least a few hours



Also, as the hinges flex, glue the canopy. Put a bead of glue on the fuselage, press together and pull apart. Allow to tack up for five minutes

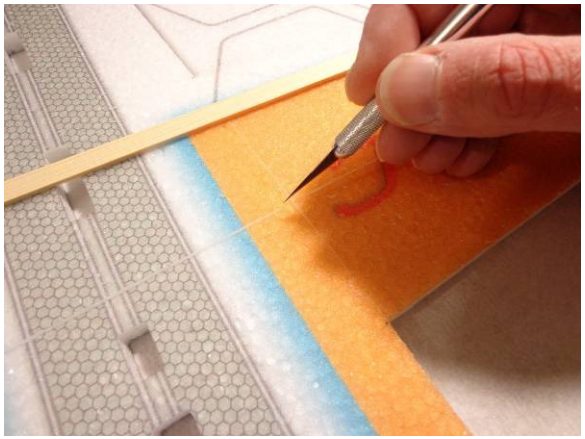
Carefully press canopy back on for a permanent bond

Remove the weights... Put a bead of glue on the wings where they meet the fuselage, press together, pull apart, let set for five minutes

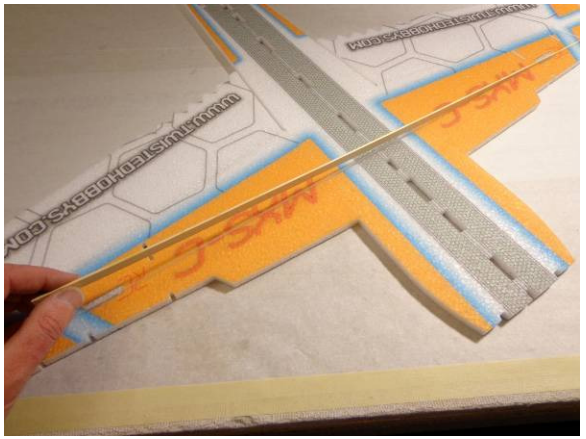


Once the glue has tacked up, carefully press wings back on for a permanent bond

Locate the wood spar

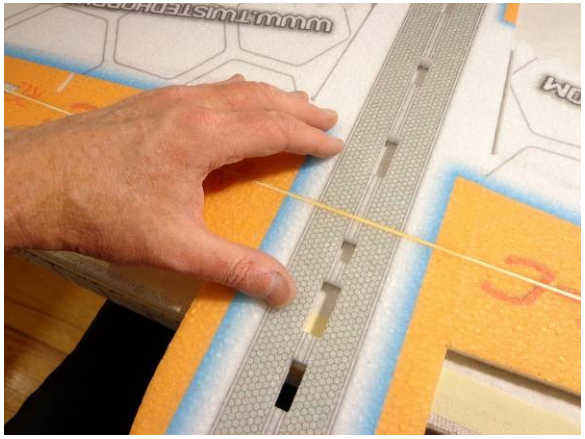


Cut out tabs that hold the wing and fuselage together so that the spar can be inserted

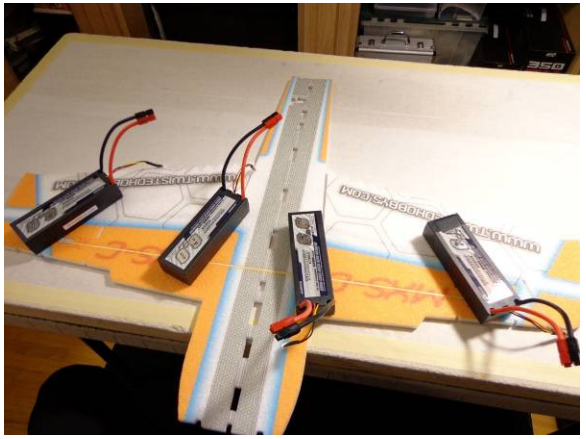


Test fit the spar, trim foam as needed

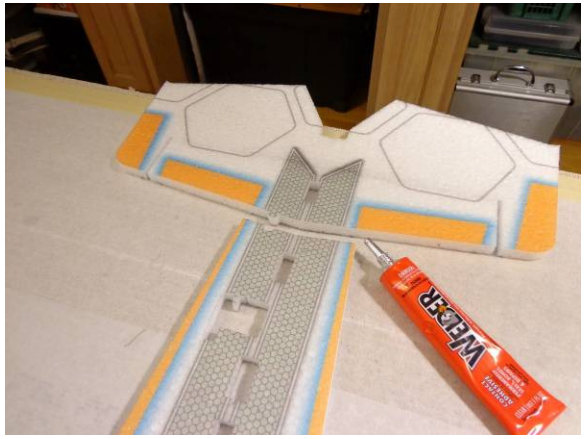
Lay parchment paper down on work surface. Spread glue inside the spar slot



Insert spar, press fuselage/wing assembly together to ensure good glue joint on spar

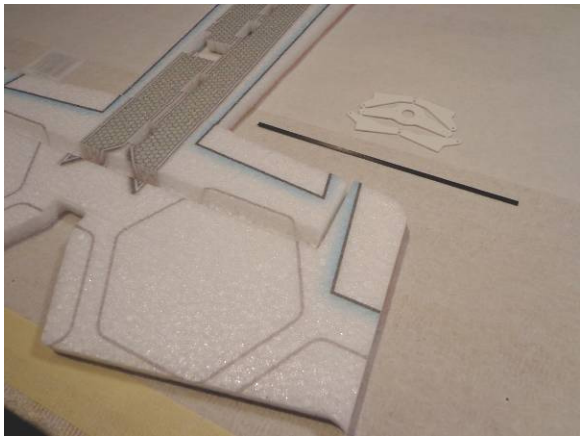


Weight down fuselage/wing/spar assembly on parchment paper, press together, let dry



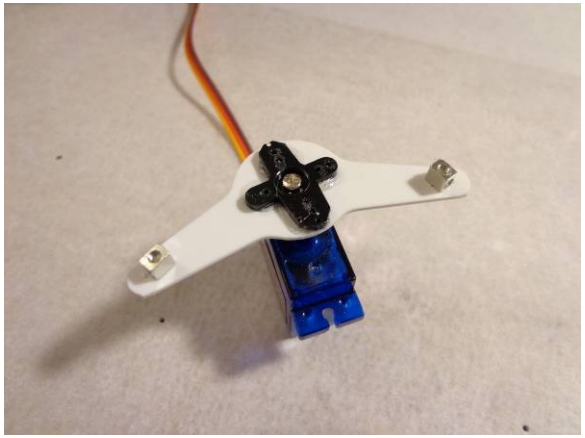
Locate the elevator/stab. Verify full down deflection is approx 50 degrees, carefully trim some foam from the bevel away if not. Apply glue via Tack Up Method

Press the stab on carefully



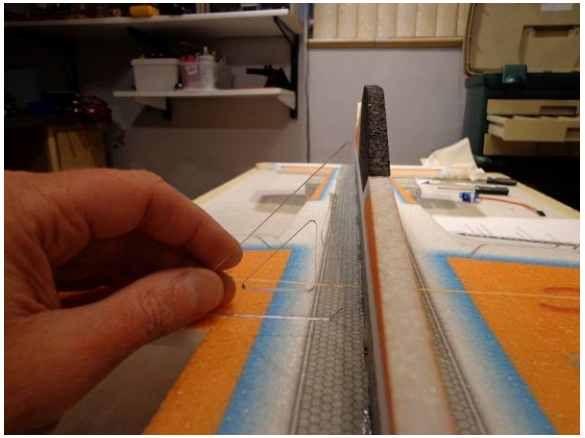
Locate the small rectangle carbon strip use to stiffen the elevator

Locate the spar slot on the underside, cut deeper as needed. Test fit, spar should be flush with the underside of the elevator. Glue in, wipe away any extra glue

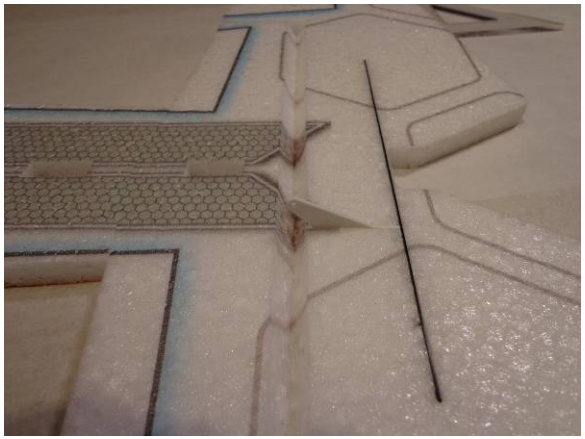


Complete the Aileron servo setup as shown. Make sure the servo is centered. Use inside holes for links. Servo horn and diff horn are glued together with Welders. NOTE - Output shaft is to the REAR of Airframe.

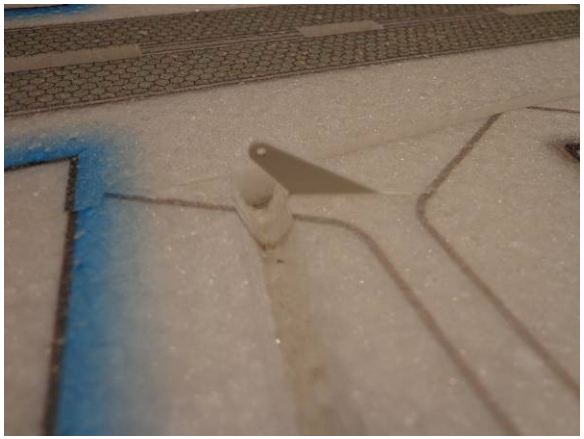
Glue the top fuselage on. Make sure to only apply glue to the flat section and the sides of the tabs during this step



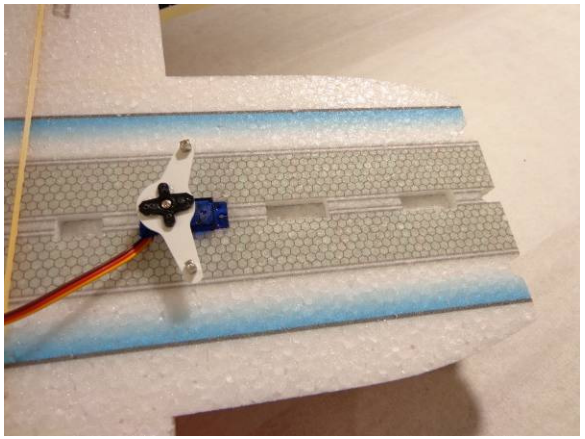
Make sure every thing is nice and square



Glue elevator horn in. Make sure it is flush with the underside surface and that the hole is in line with the pivot point. Cut the slot deeper if needed

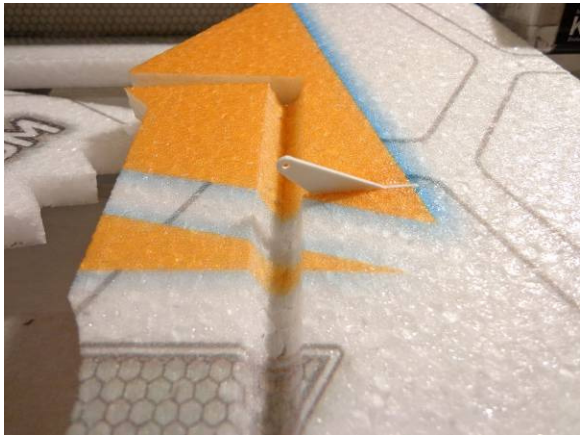


Glue aileron horns in. Make sure it is flush with the underside of the aileron and that the hole is in line with the pivot point. Cut the slot deeper if needed

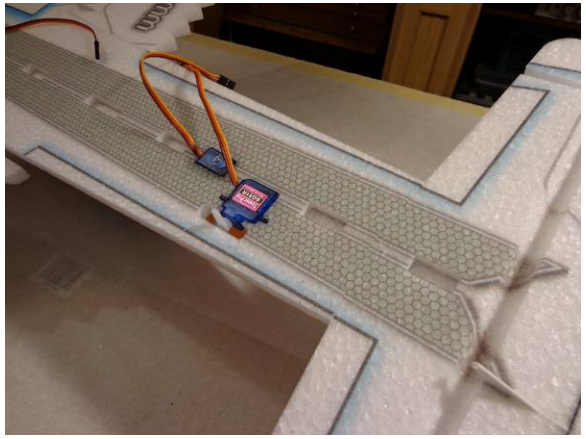


Install the aileron servo as shown. Note that the output shaft is to the REAR. Secure with a couple SMALL dabs of glue. Too much will make removal harder later if needed

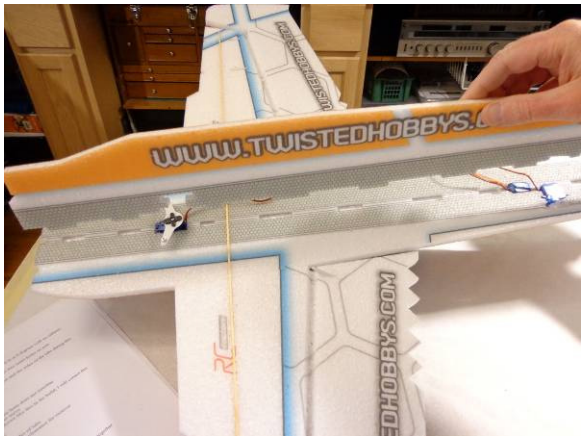
Install the Rudder Horn. Test fit in slot, cut out if necessary. Horn should be flush with the nearside surface



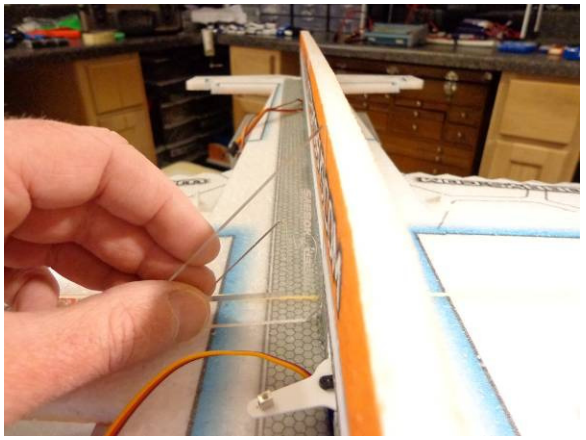
Glue the horn in. Flex the rudder back and forth to make sure the horn does not interfere. Hole in the horn should be in line with the hinge point



Install the rudder and elevator servos. NOTE - for extreme 3D control throws long servo arms are required. If not included in the servo hardware, fabricate by gluing on part of another horn. approx .75" is needed from center to link



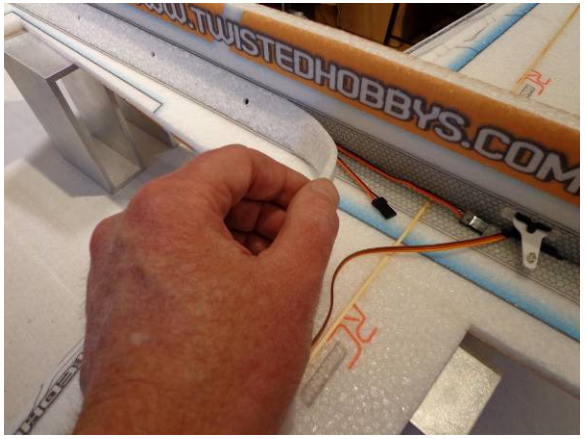
Install the lower fuselage. Use glue on full bottom surface and sides of tabs



Press pieces together for a good tight fit. Check that everything is square

Install the trusses. Figure out first were you want to locate the RX and add servo extensions as required. NOTE- for rearward location only one extension on the ESC would be needed

Install the trusses. Use tack up method. Apply glue to the truss, set in place, remove, let tack up, install. NOTE- leave one end free of glue as shown in next step. This can be cut off and used to re-enforce the motor mount or glued later

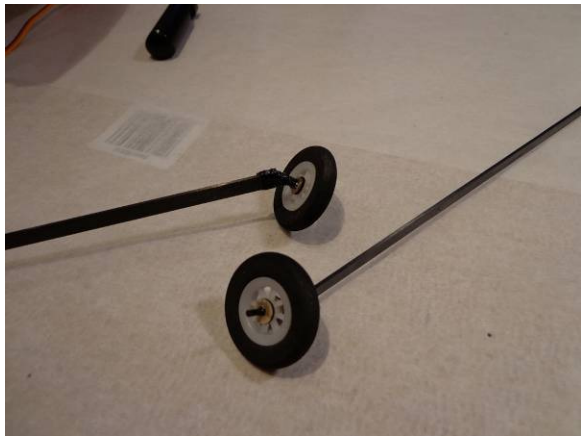


Carefully install the trusses. Make sure everything remains square. Leave one end free of glue until radio gear is installed. Handy for tucking the wires away

Glue the rudder on. Use the Tack up Method. Make sure it is in line and square with the vertical fuselage pieces

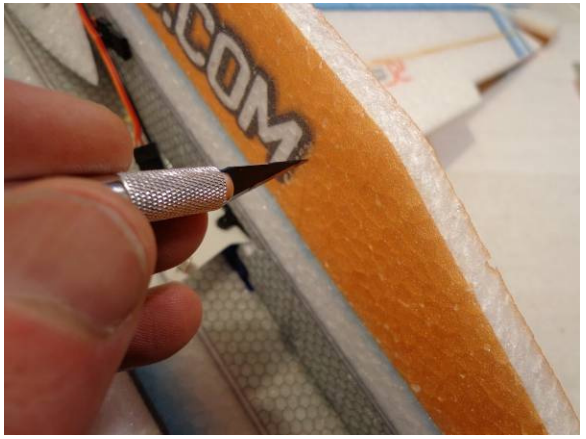
Prepare the Landing Gear. CA or Welders can be used. Wrapping with string will make it stronger. Remove all the tiny wood pieces from their plywood pack

Glue the angle braces and axles to the struts as shown. NOTE- make a LEFT and RIGHT hand version. Wrap with thread, Soak with CA or coat with Welders



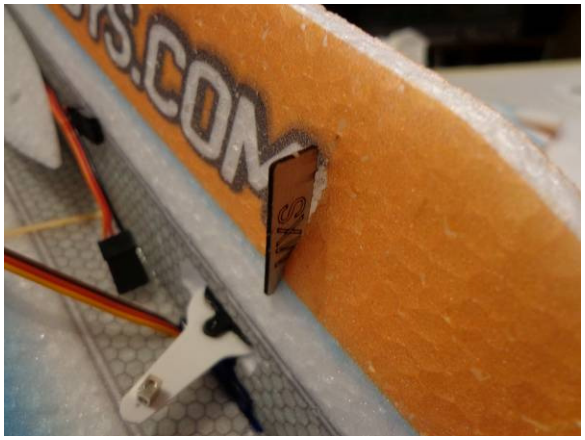
Drill the wheels out to fit the axles. Install and glue the inside washer then install the wheels. Install and glue the outside washer. Be Careful with the glue, wheels need to turn!

Glue the T-shaped wood pieces to the wheel pants. NOTE- be sure to make a LEFT and RIGHT hand version



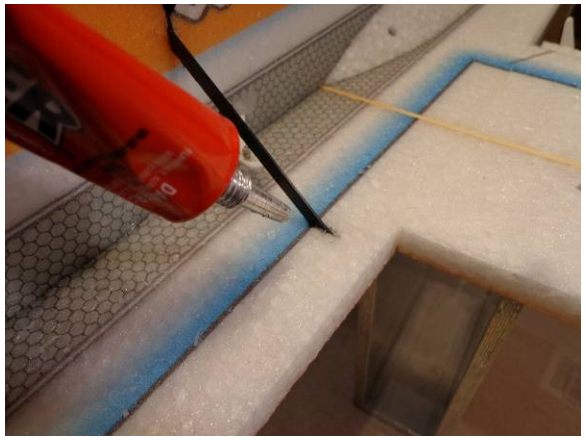
Next, install the landing gear onto fuselage, start by cutting out opening for legs and rectangular brace

Apply Welders to the extreme ends of the cut out, where it captures the wood brace only. Leave the wider section in the middle free of glue for now.



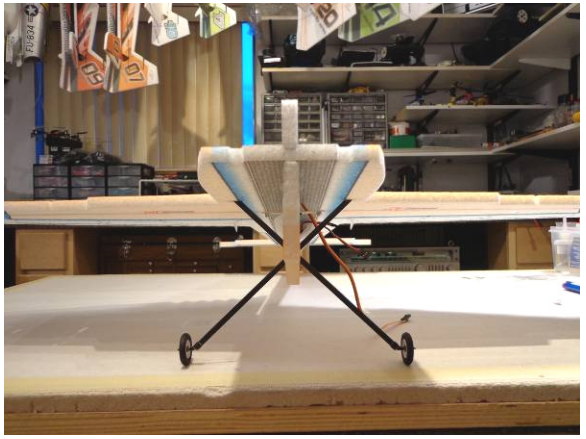
Slide the wood brace into the slot

Center the wood brace within the thickness of the foam. NOTE- in the next step... one strut will insert on the back side, the other on the front side of the wood brace

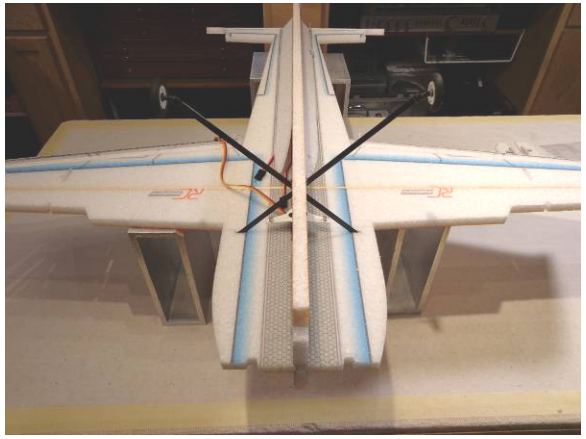


Slide the landing gear struts thru the wider part of the cut out and into the slots on the underside of the horz. fuse section. NOTE- you may need to cut these a little deeper

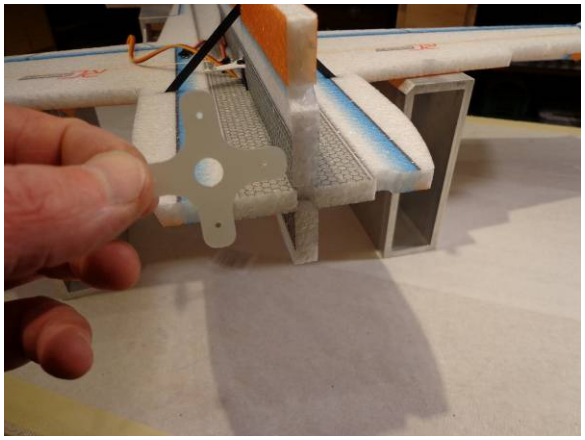
With the tip of the glue bottle, stuff some glue into the area where the struts cross thru the fuselage



Temporarily flip over onto it's wheels, and adjust the struts so that the airframe sits level

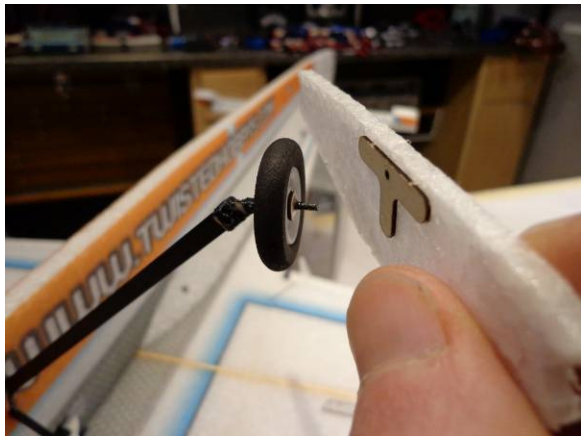


Flip back over so there is no pressure on the landing gear and allow to dry completely

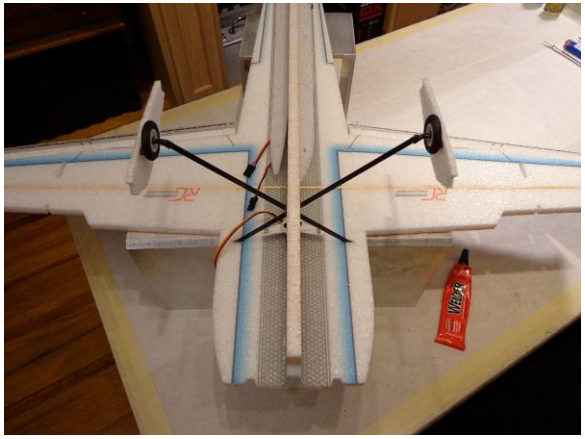


While the landing gear struts are drying, glue the fiberglass motor mount onto the front of the fuselage. Use the tack up method

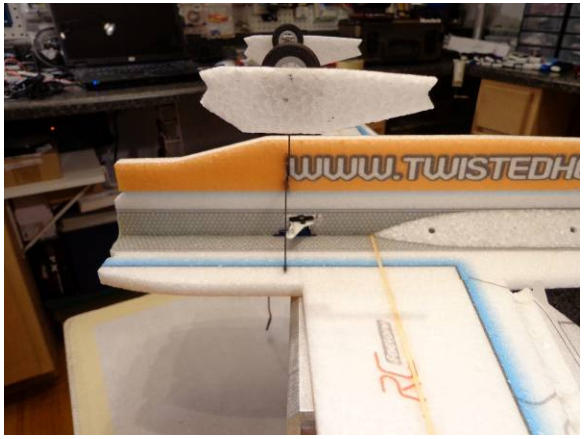
Apply glue to the mounts, install on nose, remove from nose, allow to tack up for approx. 5 minutes, assemble onto the airframe



With the nozzle of the Welders tube, force some glue into the hole of the wood T-Brace, and apply a thin coat to the axle. Assemble the two pieces. Repeat for the other side



Make sure the wheel pants are parallel to the length of the fuselage



.... as well as the bottom edge of the wheel pants being parallel to the bottom edge of the fuselage

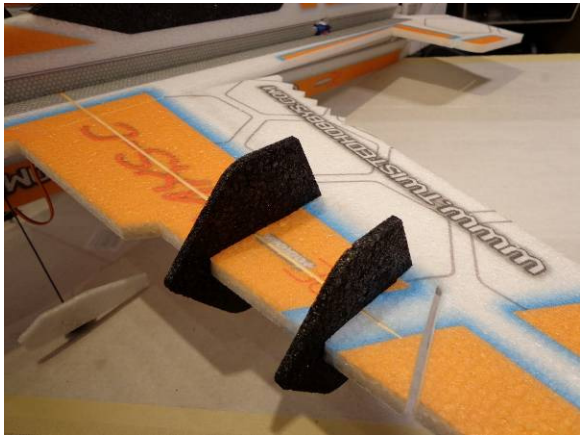
Apply little 1.50in long strips of blenderm to all the stressed areas of the airframe, starting with the legs of the motor mount...

... first lay down a skim coat of Welders in all the area where the tape will be.

Repeat the process at the end of all the hinge lines

Prepare the SFGs for assembly

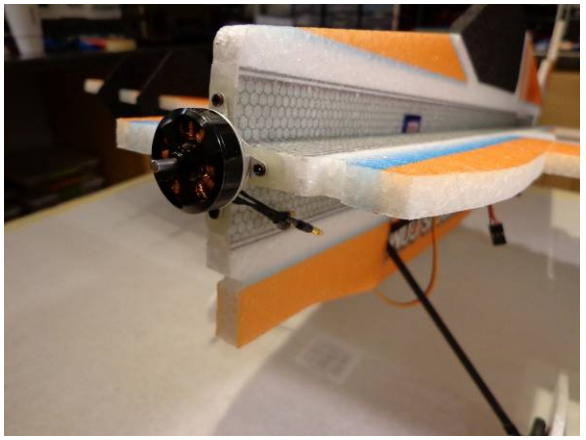
Carefully split the rear tab with a knife



Attach the SFGs. Smaller ones outboard, and shorter side of both, down

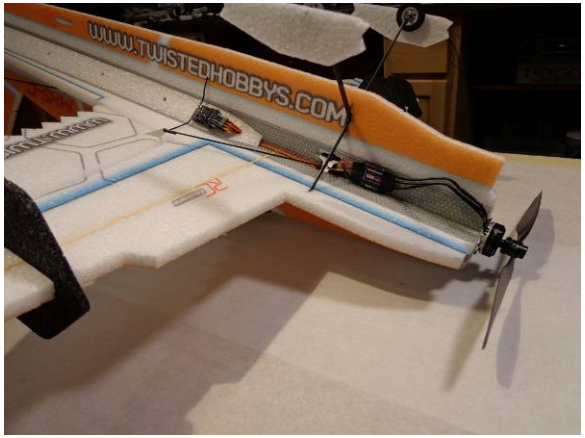
Repeat for the other side. Make sure they are square and true to the direction of flight

Locate the motor and assorted hardware. NOTE- if using 2s the included oring will work, but for extreme flying and 3s operation, the HD O-rings are recommended

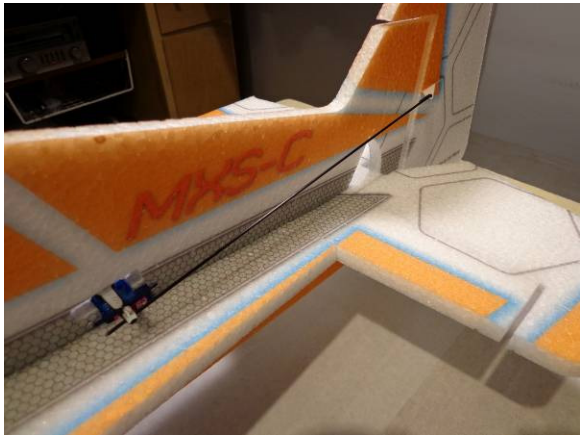


Secure the motor to the nose of the aircraft. Locate the wire on the side that you will install the ESC on.

Mount the ESC as far back as possible. For rearward RX attach an extension long enough to the ESC that allows the RX to reach the rear servos

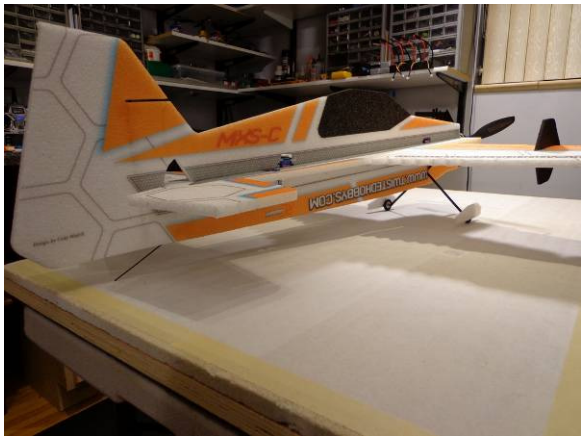


NOTE - This build was done with extensions on the rear servo side, ie Forward RX location. For Rearward RX location, the RX would be approx 1.0" behind the trailing edge of the aileron



Install the Rudder Push Rod. Clip off the extra push rod length and save for the tail skid

Install the Elevator Push Rod. Clip off any extra length.



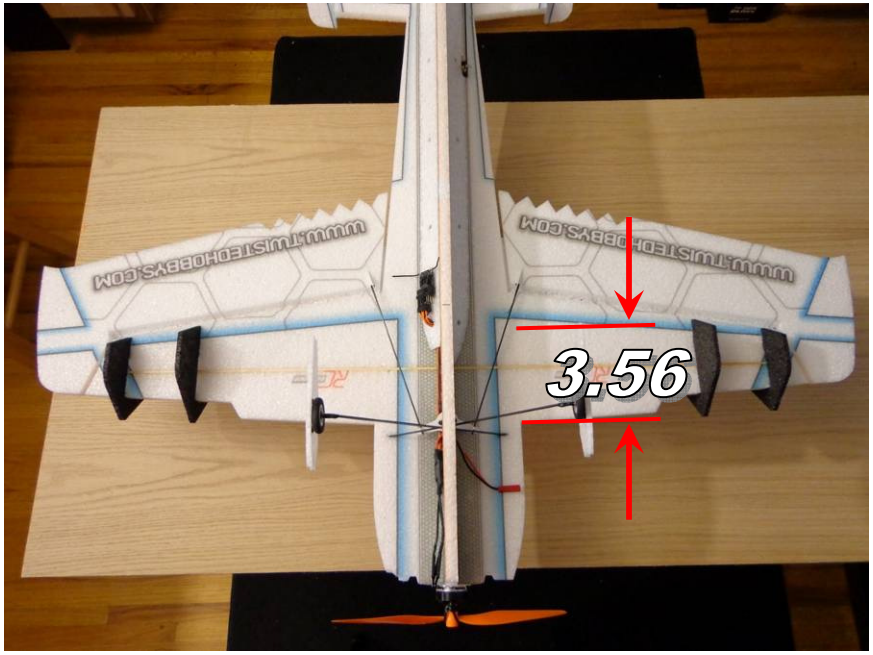
With the extra carbon rod from the Rudder, make a tail skid to protect the rear of the plane during ground operations

Max for all control throws is +/- 50 degrees. All the hinges must move freely in order to achieve these angles of deflection

CG is 1.25" behind the spar or approx 3.56" from the leading edge of the wing.

CENTER OF GRAVITY

CG - 3.56" from leading Edge of Wing



CONTROL THROWS

Extreme & 3D:

Ailerons - approx +/- 50 deg
Rudder - approx +/- 50 deg
Elevator - approx +/- 50 deg
Expo to suit

Beginner & Sport:

Ailerons - approx +/- 30 deg
Rudder - approx +/- 30 deg
Elevator - approx +/- 35 deg
Expo to suit

EXTREME & 3D SET UP PRECAUTIONS

In order to achieve the control throws as suggested above described for "Extreme & 3D", it is imperative that the control surface, linkages, rod ends, etc, all move freely over the entire range, including range end points.

Failure to do so will result in damage to either the servos or mechanical components!

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.

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 Extreme 3D Plane 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 the perfect size for the local park or school yard.

Storage

This EPP plane should be stored resting on the Bottom Pod. 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!

NOTES & S/U SHEET

Setup Sheet

Transmitter - Receiver -

Weight - g oz

CG Point - mm from wing leading edge

Model

timer - min

Travels and Exponential

	low rate	high / 3D
right aileron up -		
right aileron down -		
left aileron up -		
left aileron down -		
aileron expo -		
rudder right -		
rudder left -		
rudder expo -		
elevator up -		
elevator down -		
elevator expo -		

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.