TWISTED HOBBYS

manufactured by: RC factory

1000kV motor (45g - 55g)
20 - 30 amp ESC
5 channel radio
4x 10g to 16g servos
10x3.8 to 10x4.7 SF prop

USA Distributor

Twisted Hobbys

www.twistedhobbys.com

39" Models

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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 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

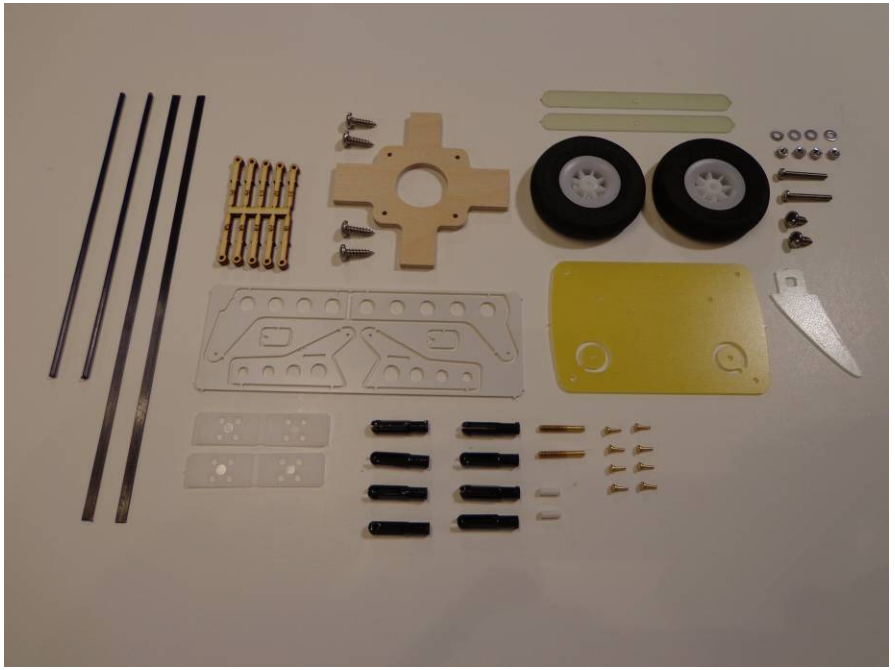
- ✓ Before assembling and flying this model, read carefully any instructions and warnings of other manufacturers for all the products you installed or used on your model, especially radio equipment and power source.
- ✓ Check thoroughly before every flight that the airplanes' components are in good shape 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 Horz. Fuse
1x Rudder
1x Elevator
2x Fuselage Truss
2x Wing Tip SFG
2x Inboard SFG
1x Canopy

1x Hardware Pack
(see detail)
2x Wheel Pant
2x 1mm x 500mm Round
(elev. & rudder control rods)
2x 1.5mm x 800mm Round
(wing spar)
1x Carbon Landing Gear Strut
2x .5mm x 3mm x 500mm fuse spar

DETAIL - HARDWARE PACK

2x 1.8mm x 110mm Rod
(aileron control rods)
2x 3.0mm x 0.5mm x 150mm
(elevator spars)
1x Push Rod Guide Set
1x Plastic Control Horn Set
2x Hinges
8x Plastic Rod Ends
8x Brass Rod End Pins
2x Threaded Ferules
2x Rod End Spacers

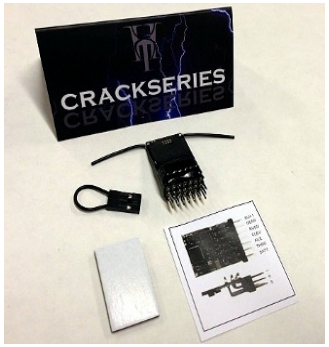
2x Wheel Pant Mount Plate
2x Light Weight Wheels
1x Fiberglass LG Plate
4x Small Washers
4x Small Nuts
2x Long Machine Screw
2x Short Wood Screw
1x Tail Skid
1x Wood Motor Mount
4x Long Wood Screw

OPTIONAL PARTS

Crack Power Combo

(Matched by Twisted Hobbys)

(1) Crack Series 50g/1050kV Motor
(1) Crack Series 20A ESC
(4) Crack Series CS-90 11g Servos
(1) 10 x 3.8 Slow Fly Prop



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

3 Cell / 600mAh / 5c Charge Rate
Discharge 25c Constant / 50c Burst
JST Connector / Dims. 72x34x16

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

This Manual uses the 540 Edge for it's build subject. The Crack Yak and Extra 330 have the same build sequences and this manual can be used for their construction as well. Where the minor differences come up, it is noted.

CONSTRUCTION METHODS:

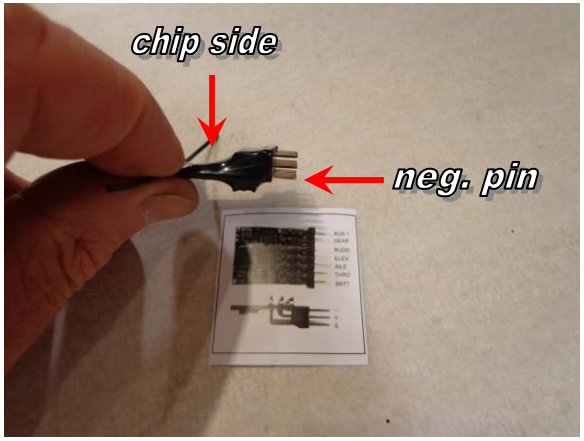
Building surface should be at least 2ft x 4ft and flat. Weights or some small heavy objects will be handy for holding things in place.

Welders glue is the primary adhesive used for this build. The Rod Guides and End Links use thin CA with Applicator and Activator. **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.

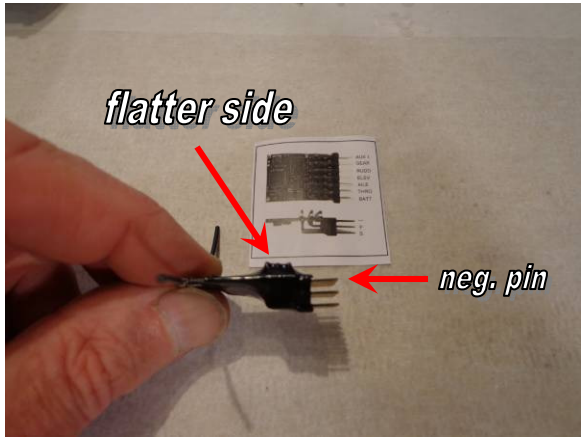
Open up you kit and inspect for damage and / or missing parts. Use the Parts List on page 5 to verify that your kit is complete.

Do the same with the Power Set, confirm that you have all your items and that they appear to be in sound condition. Testing of functionality will be one of the first steps that will follow shortly.

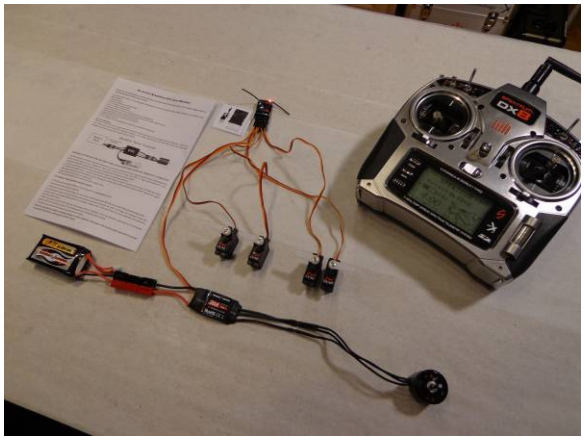
Make a new program in your Radio. Zero all the Trims and Subtrims. For starters all the ATVs can be set to 100%. Adjustment of additional settings will be done at the end of the build.



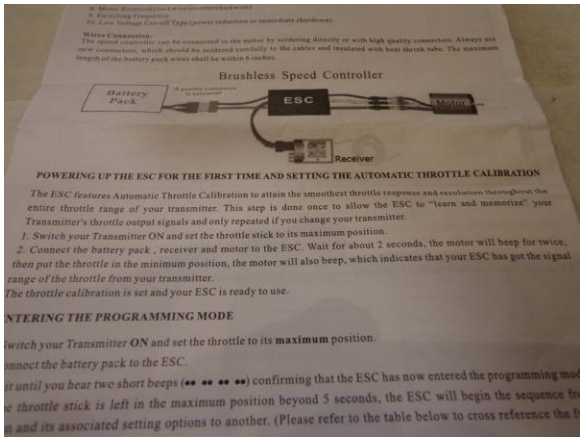
Identify the porper pins for the; Throttle, Aileron, Elevator and Rudder Channels. Carefully compare to the diagram to make sure you have the correct orientations.



Compare your Reciever to the included diagram from the side as shown above. Make a note of the polarity of the pins. In most cases, either Black or Brown is used to identify Negative (-).



Plug Motor wires into the ESC, the ESC into the Throttle Channel, and the servos to their appropriate channel. Bind per your Radio's Instructions.


Brushless Speed Controller

Battery Pack

ESC

Motor

Receiver

POWERING UP THE ESC FOR THE FIRST TIME AND SETTING THE AUTOMATIC THROTTLE CALIBRATION

The ESC features Automatic Throttle Calibration to attain the smoothest throttle response and resolution throughout the entire throttle range of your transmitter. This step is done once to allow the ESC to "learn and memorize" your Transmitter's throttle output signals and only repeated if you change your transmitter.

1. Switch your Transmitter ON and set the throttle stick to its maximum position.
2. Connect the battery pack , receiver and motor to the ESC. Wait for about 2 seconds, the motor will beep for twice, then put the throttle in the minimum position, the motor will also beep, which indicates that your ESC has got the signal range of the throttle from your transmitter.

The throttle calibration is set and your ESC is ready to use.

NTERING THE PROGRAMMING MODE

witch your Transmitter ON and set the throttle to its maximum position.

nnect the battery pack to the ESC.

it until you hear two short beeps (•• •• •• ••) confirming that the ESC has now entered the programming mo

e throttle stick is left in the maximum position beyond 5 seconds, the ESC will begin the sequence fr

n and its associated setting options to another. (Please refer to the table below to cross reference the f

Program the Throttle End Points per the ESC Instructions and next couple steps….

… turn off your Transmitter and unplug the flight battery from the ESC, position the Throttle Stick to full HIGH postion and power on the radio…

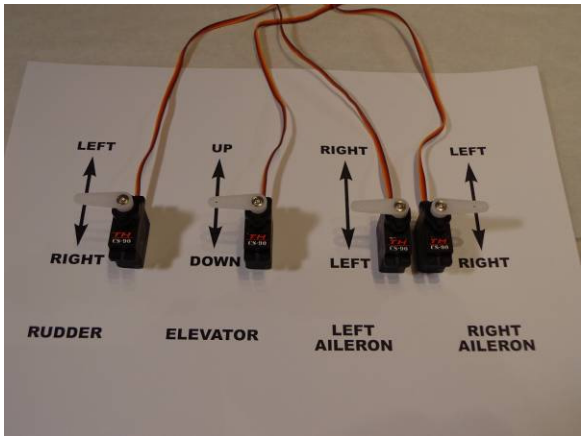
…. reconnect the battery to the ESC and listen for two quick short beeps, immediately following the beeps, move the Throttle stick to low position.

Next you should hear a series of tones to indicate that programing is complete.

Re-bind the system and double check correct operation of all components.

Center all servos as close to 90 deg as possible. Install the Longest single arms on the servos.

Chose Flaperon Wing Type - this will allow you to mix up and down aileron with elevator that comes in handy for Harriers and other high alpha maneuvers



Program your radio so that the channels & directions match the picture above. Horns should be installed as shown, double check that subtrims - arms should be at 90 deg

Fold back all the control surfaces and let stand for an hour or so, this will loosen up the hinges and allow the servos to work more freely

Split the horizontal fuse section as shown, remove the tabs to flush. Find the precut slots in horz fuse, install .5mm x 3mm x 500mm FLAT carbon piece on either side as shown.

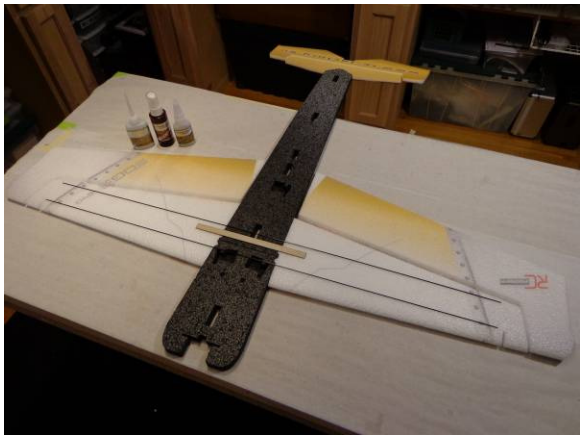
Do not use the round Carbon Fiber for this step

The two shorter carbon strips are used to re-enforce the Elevator, bottom side slot is started, make deeper so spar is flush, coat with welders and install

Repeat on the top side, same location, but you will need to make the slot from scratch. Coat with Welders and install

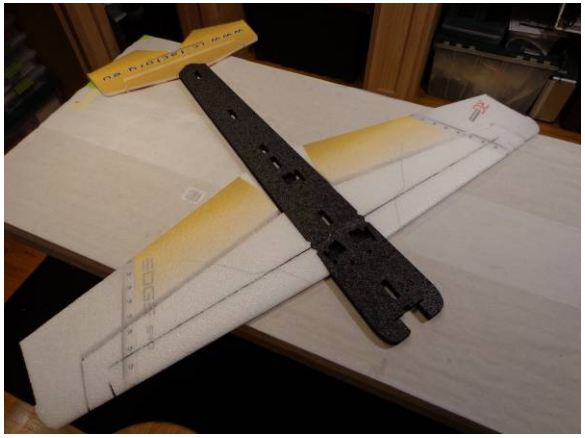
Elevator and Wings to Fuselage - Tack Glue Method. Medium bead of Welders, bring together and separate immediately - let tack up for 10 minutes or so

Bring all the pieces together. There should be a thin gap in the fuse where the tabs were, this is for the wood spar. NOTE - top of elev. flush with top of fuselage - bottom side shown



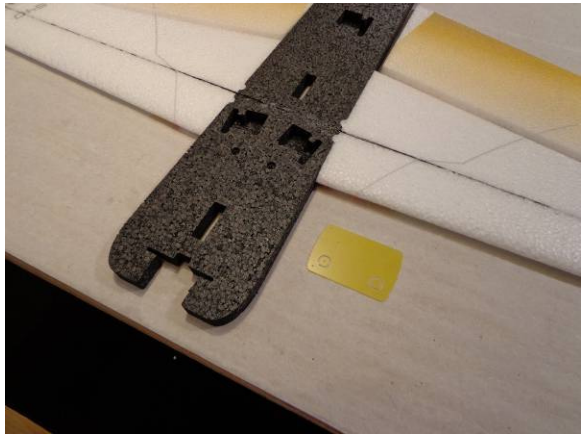
Wing Spar Assy consists of - 2 pcs **1.5mm x 800mm Round** and 1 wood spar. Wood spar is sandwiched vertically between the two rods and centered from left to right with the center of the fuselage assembly

Cut a slot just deep enough for the rod, align the cut with center gap for the wood spar. Center side to side and repeat on the top side



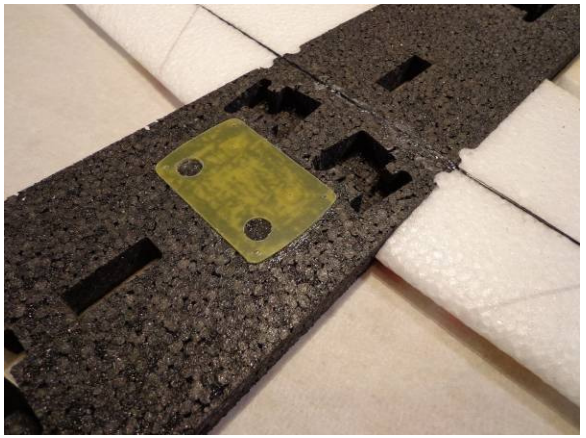
Insert the wood spar - insert bottom rod - flip over and insert top rod - Med. CA in the center wood spar section - Thin CA everywhere else. Do this on a flat table and make sure the wing is flat

Repeat CA procedure on the top side - Check that the spars are fully bonded, add more CA if necessary. Make sure everything is still flat

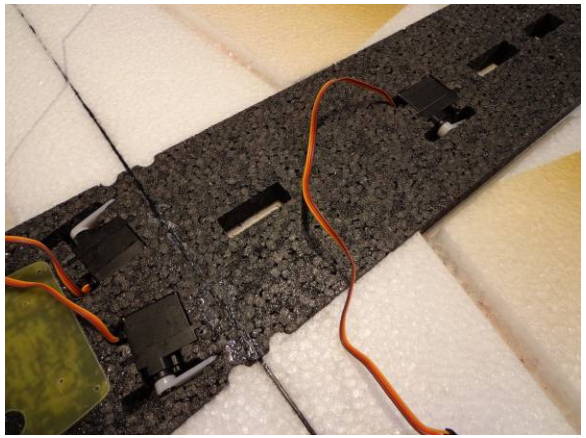


Landing Gear Plate - Rough up the side that will be glued to the fuselage.

Break out the little round doublers and glue with CA to the main piece. Use a small drill or piece of old carbon rod for alignment. Locate the short wood screws and pre-tap the holes.



Fully coat the back side with Welders and position so that the doublers are located in the relieved area

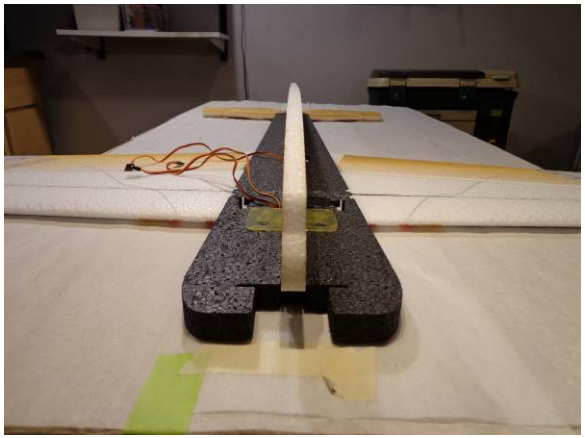


Locate your servos as shown. If you did your set up in the beginning, make sure you get the right servos into the right positions. No glue at this time. Slits for the tabs are necessary.

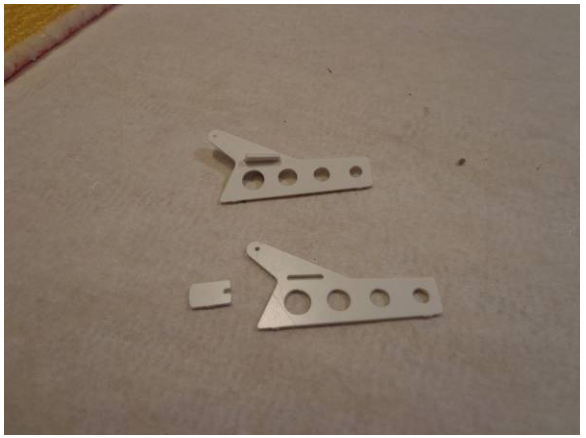
Split the fuselage down the middle using the little tick marks for reference

Apply Welders to all the mating surfaces, avoiding the area were the elevator servo is installed

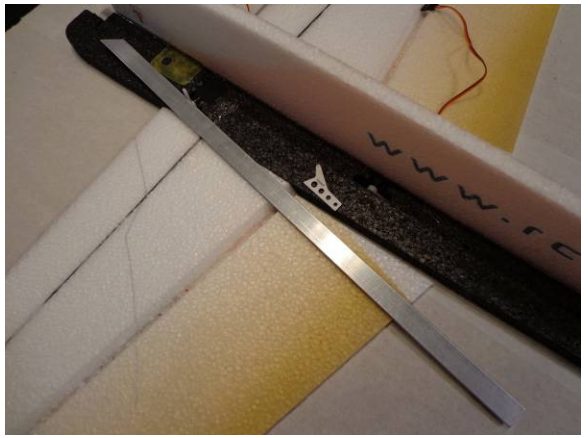
Mate the two pieces together and check for a good flush fit and that all the tabs are fully engaged



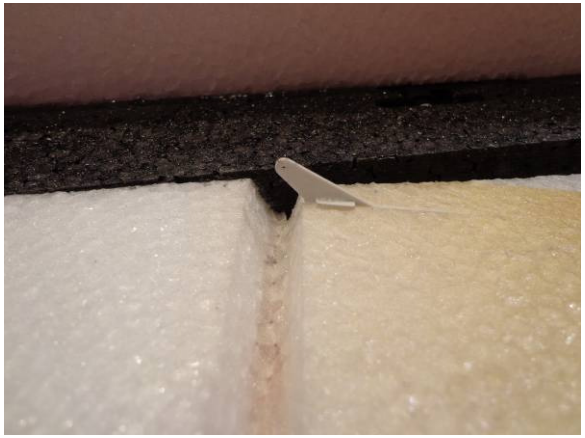
Make sure everything is square, tweak and adjust as necessary. Let dry before lifting if from the work bench



Prep the Aileron horns, these are the smaller ones, and they have a little cross tab that needs to be CA'd into position as shown



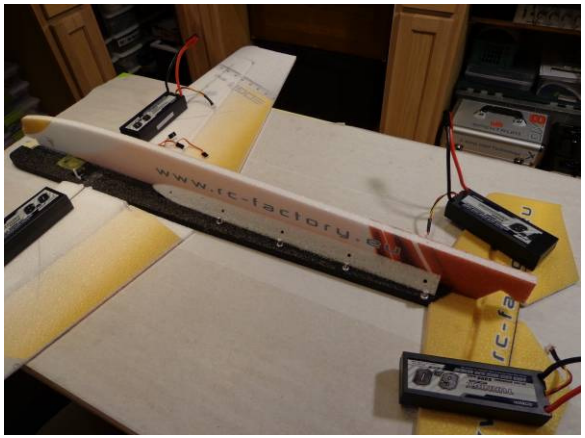
With a straight edge, make a slot for the horn that is inline with the servo arm. Locate the slot along the straight edge such that the control arm hole is over the aileron hinge line



Locate and glue the horn into position, noting that the hole of the horn should be inline with the hinge point

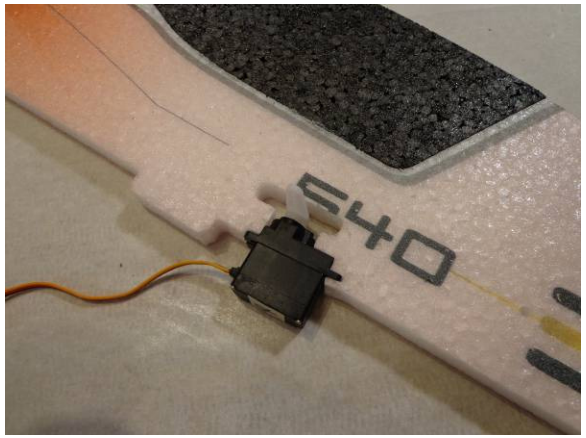
With a bead of Welders, glue the Canopy to the top half of the fuse and set aside to dry.

Glue the truss supports to the fuselage as shown, either wet or tack up method could be used. Some kits will have black truss foam pieces



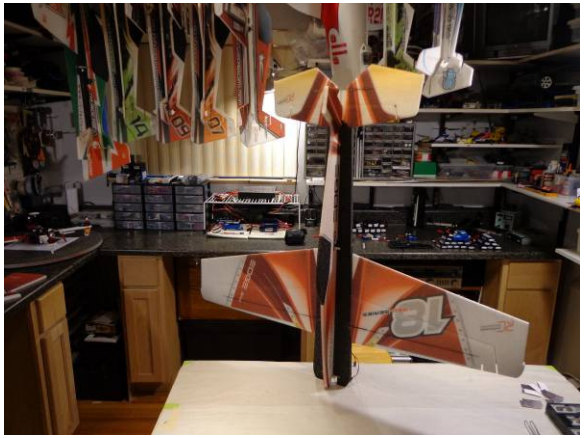
Make sure the airframe is nice and flat for this process, double check for squareness again

Glue the motor mount to the bottom and horizontal fuselage sections



Install the rudder servo. You will need to cut a slit for the servo mounting ear. No glue at this time

Coat all the mating surface of the upper fuselage section with Welders, and feed the rudder servo wire thru the fuse

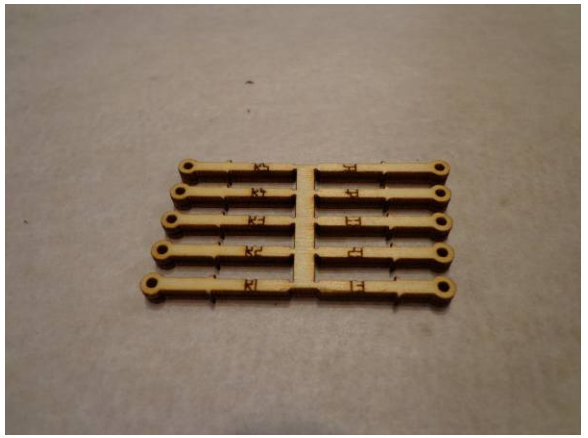


Bring the two pieces together, make sure all the tabs are fully seated and that everything is square

Install the two hinges approx as shown, exact location is not criticial

Match the Hinge locations on the Rudder

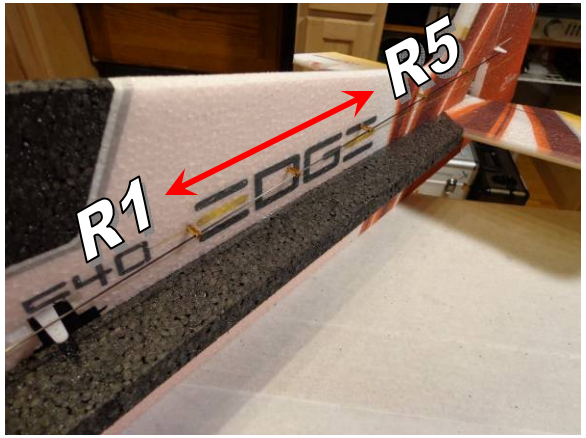
Install with Welders and line everything up, make sure and leave enough gap for full side to side operation of the rudder and clearance for the elevator swing, approx 3/16" is needed



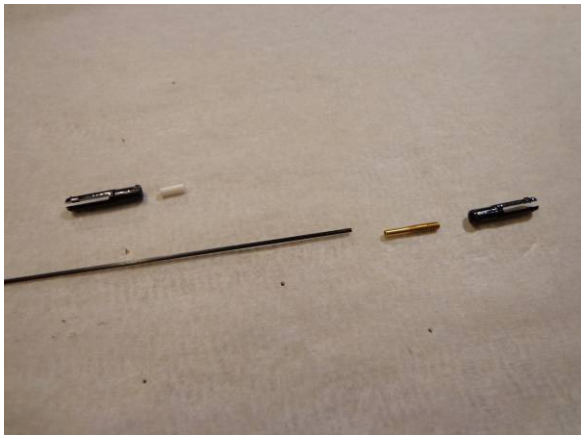
Push rods for the tail feathers is next… Locate the push rod guides and notice that they are specific to each control surface and are of various lengths

Remove the elevator control horn form the kit blank, make sure you get the one shown above

Install the control horn with the hole over the hinge line, next a dab of Welders in the holes and install the "E" guides using the control rod as a guide.
Order is: E1=Servo / E5=Elevator



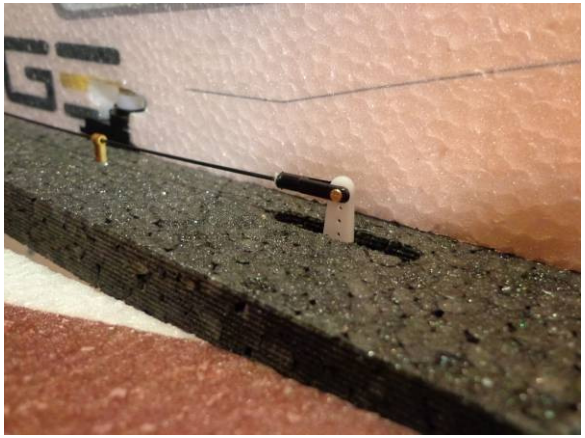
Repeat the previous step on the Rudder side with the "R" guides.
Order is: R1=Servo / R5=Rudder



Two connectors, one sleeve doubler, a threaded ferrule and two brass pins per assembly. It may be necessary to sand the **1mm dia rod** slightly to fit the ferrule. Brass pins not shown.

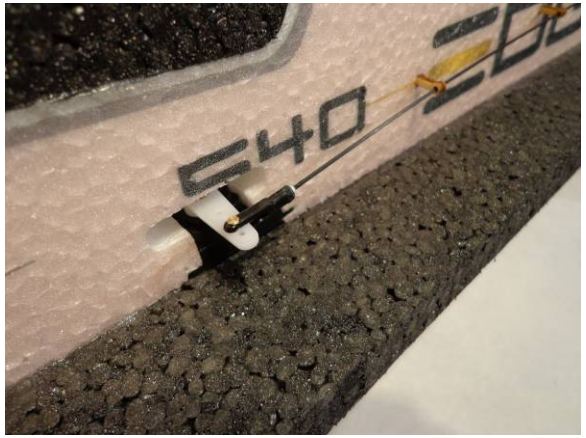
Start with the end that gets glued on with the sleeve doubler. Press everything together and add a drop of thin CA to where the rod enters the connector

With the elevator and servo in their neutral positions - secure the connector on the servo end, cut the rod to length, attach the ferrule with a drop of thin CA and install the connector.

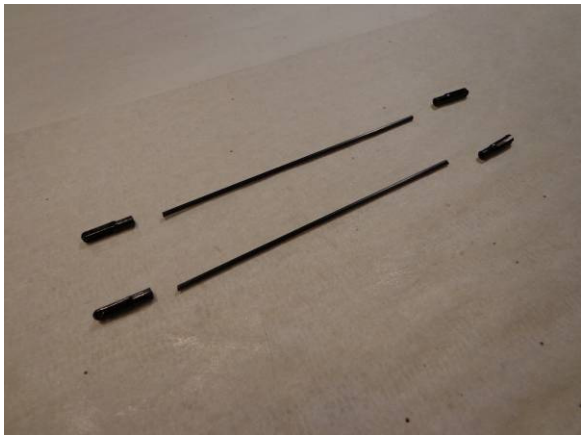


Fully seat the brass pins into their respective connectors. Note - furthest out hole for elevator servo arm

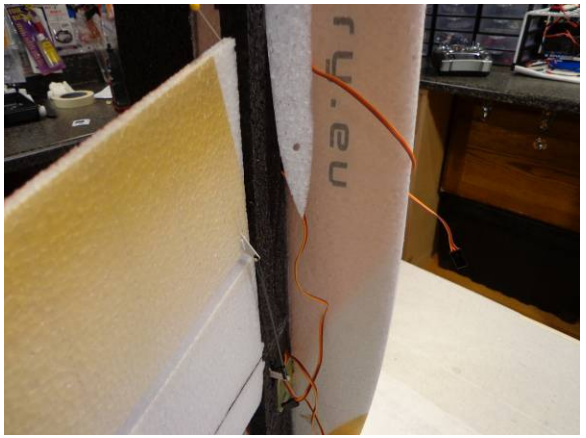
Repeat the process for the Rudder side



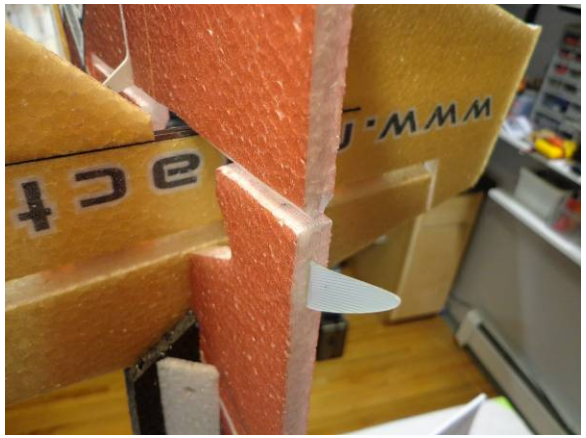
Location of the connector for the rudder servo should be on hole in from the outside.



Aileron Control Rods **(1.8mm dia)** - these are to length already, make sure that the connectors slide freely onto the rod, sanding may be necessary. This will make adjustment easier



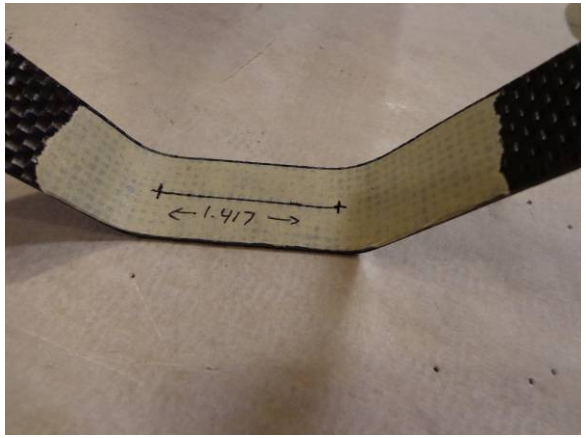
Install a connector on the horn and one on the servo (outside hole), insert the rod in-between. Make sure the servo and control surface are neutral than apply a drop of thin CA to each end



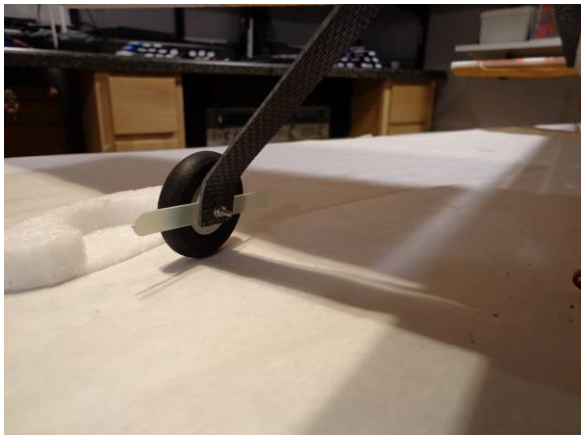
Cut a slot for the tail skid approx where shown. Add some Welders to the slot and to the tab of the skid. Install and let dry

Round up all the Landing Gear pieces

Drill a hole for the axle screw, approx 3/16" up from the end, and centered in the width

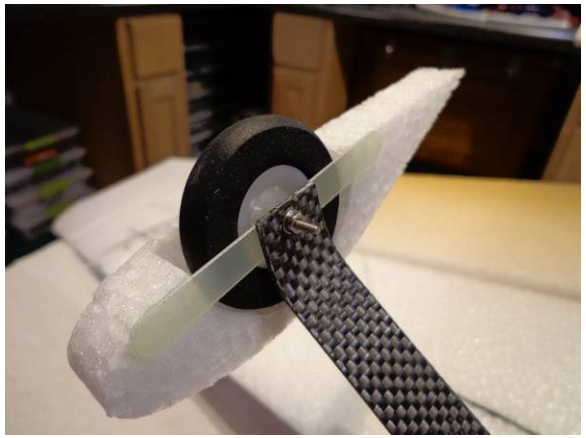


Mark and drill fuselage mounting holes, 1.417' apart and centered between the bends and width

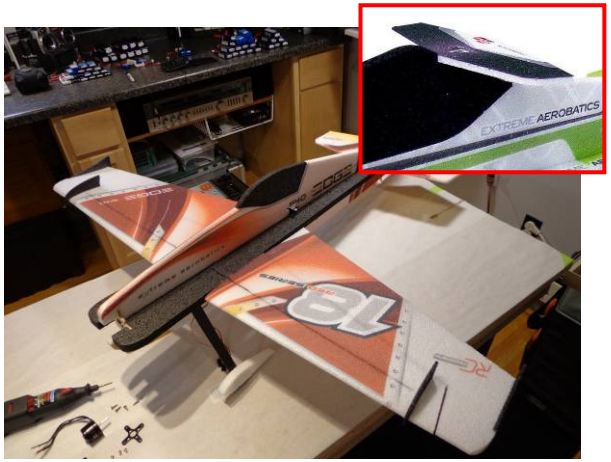


Attach as Shown. Order is: wheel - nut - washer - pant - brace - landing gear - nut. Tighten and add a drop of CA to the nut to keep it from backing out.. Repeat for the other side

Wheel Pants and SFG's will be installed next



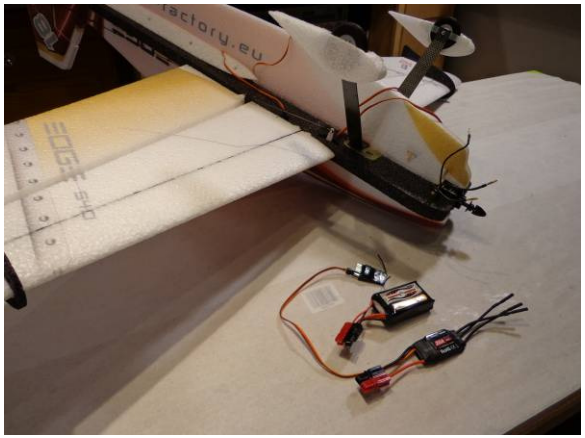
Attach the Wheel pant as shown, make sure the wheel has clearance to spin. Repeat for the other side.



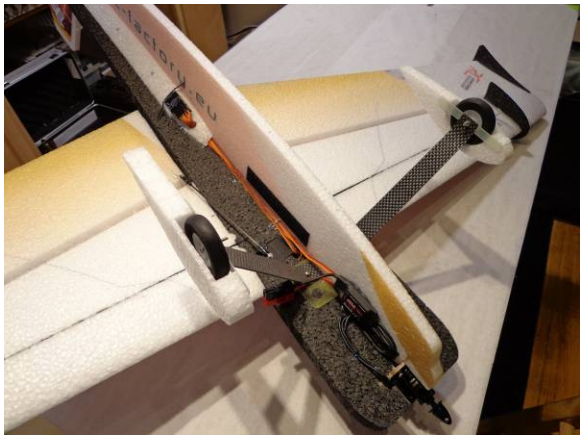
Side Force Generators installed. Make sure they are square to the wing. Use Welders or CA. Yak SFGs spacing is 2.50". Yak Canalizer installed now also.

Round up all the shown items. Shaft sticks out the back, make clearance in the airframe for it. Assembly the hub & mount. Use thread locker

Mount to the firewall with supplied wood screws



Electronic Assembly - Goal is to get the battery to install as close to the CG as possible, that way various size batteries can be used. Install the ESC towards the nose.



Everything installed. Battery location will be slightly ahead of the CG - which is 3.75" back from the leading edge at the fuselage. Velcro used to secure the battery

Balance a couple props. Note this is an important step. Not only are vibrations hard on the airframe, they will rob your motor of power.

Test that the motor and all the servos are the right direction. If you set the servos up like the earlier diagram, all the directions should be right

Set all your End points and Dual rates. Use subtrims for any fine adjustment necessary to the neutral positions

<u>High Rates / Max Travel</u>
Elevator ±60 degrees
Rudder ±45 degrees
Ailerons ±40 degrees

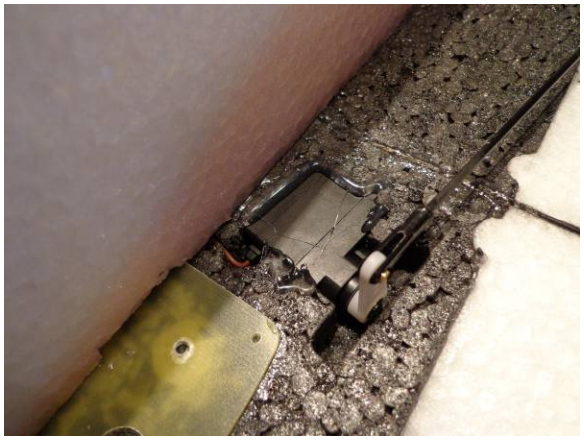
FINISHING TOUCHES

Tuck all the wires away and clean up any glue strings that are left over from the assembly process.

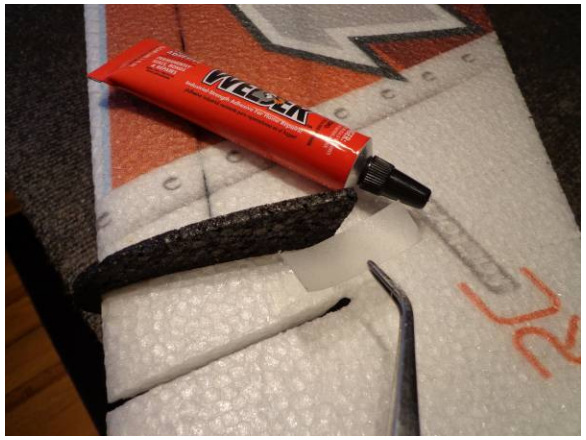
Double check that all the glue joints are robust and secure.

Verify that servos are not stalling at the extreme ends of travel.

Double check that all control movements are in the proper direction for command input



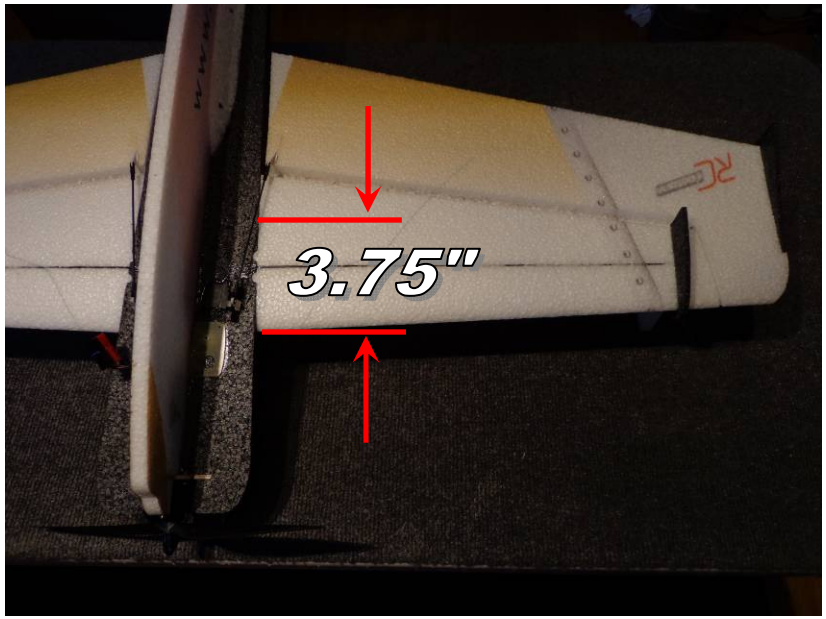
Secure the servos with low temp hot glue in any area you can reach. This method will enable easy removal if needed in the future.



Add approx 1" of Blenderm to the ends of all the hinge lines. Spread a thin layer of Welders in the area were you want to stick the tape and let tack up, than apply the tape into position

CENTER OF GRAVITY

CG - 3.75" from leading Edge of Wing (all models)



Locate all the electronic to achieve indicated CG point. Use Velcro for initial flights for battery mounting and experiment with it's position until you have determined the best spot for your flying style. For best 3D performance a slight touch of down elevator will be needed for inverted flight, and power off down line should be straight down without any pull or tuck

CONTROL THROWS

Extreme & 3D:

Ailerons - approx +/- 40 deg
Rudder - approx +/- 45 deg
Elevator - approx +/- 60 deg
Expo to suit

Beginner & Sport:

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

Mixes:

With a two servo wing, 5-10% differential will improve rolls. Flaperon mix could also be set up, start with approx 30% of up/down flap, mixed with up/down elevator (elev. is master)

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.

...Enjoy!