

A FLYING WING SUITABLE FOR FPV

MOTOR: 1x 24-26g/1450kV Outrunner ESC: 1x 10-12 amp SERVOS: 2x 9-10g PROP: EP 8040 BATTERY: 450-850mAh

USA Distributor

Twisted Hobbys

www.twistedhobbys.com

RADIO: 3 ch w/elevon mixing WINGSPAN: 35-1/2" LENGTH: 19-5/8" AUW: 240g/8.46oz (w/850-3s)



SAFETY NOTIES

- 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.
- **O** 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.



TWISTED HOBBYS

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

Thank you for your purchasing a Twisted Hobbys' model. Please <u>read through the entire manual</u> 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.

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KIT CONTENTS



MAIN AIRFRAME COMPONENTS AND KITS

Double check that you have all the above pictured items. The Carbon Bundle includes tail push rods and wing spars. Also pictured above is the bag with all the small hardware items, see the detail to the right for items in should contain.



HARDWARE KIT DETAIL

Double check that you have all the above pictured items. There are two extra snap links included and the use of the shrink tubing is optional. If any of the airframe or hardware items are missing, contact Twisted Hobbys before starting your build



TOOL AND 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

- Lighter
- Small Drill Bits
- Tape Measure and Ruler
- Black Sewing Thread
- 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 and Medium CA
- CA Applicator Tips
- Activator



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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 for FOAM TO FOAM joints. Thin and Medium CA are used on the PLASTIC TO FOAM and CARBON TO FOAM joints. 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.



You will need the electronics as listed on the cover page. Now is a good time to test everything. Create a Model Profile on your radio, hook everything up and test for proper operation of all items. See the Twisted Hobbys' website for pre-packaged power combos.



Carefully fold back the two control surfaces and weigh them down as shown. If they seem stiff, just go slowly and work it a little back and forth until you can double them back like pictured. Let them sit for about an hour, this will loosen up the hinge and result in less stress on the servos.





With the bottom surface faceing up, test fit how the two halves meet up, it will be important during the gluing process that the trailing edge part of the wing be flush with the table.



The above picture shows that with a little pressure the trailing edge sits flush on the work surface.



While applying a little pressure as previously described continue test fitting and observe how all the areas come together.



Once you are happy with the test fitting apply a medium skim coat to the mating surfaces of each wing half. Welders will be used through out this manaul but....



... Beacon Foam-Tac also works very well and can be used as an alternative.



Let the glue tack up for about 5 minutes.





Once the glue has tacked up, the halves can be joined. Some weights will be used to ensure the trailing edges remain flush with the work surface during the mating process.



Carefully and Slowly slide the two pieces together while paying close attention to line up the features of each half.



Once contact has been made, apply some pressure to so that the surfaces come into complete contact with one another.



Next the rear center section will be added, again with the trailing edges flush to the work table. Apply a medium skim coat to the mating surfaces.



Let the glue tack up for approx 5 minutes.



Once the glue has tacked up the two pieces can be joined. Make sure the bottom of the wing is facing up and that the trailing edge if flush with the work surface.





Center triangle piece with the notches cut into the trailing edge.



With a long straight edge, prepare to cut a 1/8" deep slit for the bottom main spar. The slit should be approx 1/8" in front of the notches for the Fins.



With a sharp blade cut the slit, make sure and hold the knife perpendicular to the straight edge, only go 1/8" deep, and long enough to receive the long (main) spar.



Wipe the spar down with alochol to remove any mfg residue, then work it into the slit that was just cut.



Press the full length of the spar into the slit, but just deep enough so that the spar is flush to just below flush, as pictured above.



Secure the spar with thin CA...





... and hit with kicker.



Flip the wing over and repeat the process for the top main spar, also 1/8" in front of the holes for the Fins.



As with the bottom, cut a 1/8" deep slit to accept the spar.



Clean the spar with aolchol and press into the slot using your hands and fingers to push against and not the work surface. This prevents the wing from getting distorted.



Make sure it is flush to below flush like was done on the bottom spar.



BEFORE gluing flip the wing over and check that it is still flat along the trailing edges, if not tweak it slightly so that it is.





Once satisfied that the trailing edges are flush with the work surface, carefully flip back to the top surface and apply CA.



Once CA has been applied the full length of the spar, hit it with kicker.



The short front bottom spar is next, clean with alcohol, cut a 1/8" deep slit long enough for the spar and at approx 4-1/2" in front of the main spar.



Press the spar into the slot, and again just deep enough to be flush to slightly below flush.



Apply thin CA the full length of the spar...



... and cure with kicker.





Flip the wing over and locate the top front spar in the same manner; centered and approx 4-1/2" in front of the top main spar.



Wipe the spar with alcohol and press into the slot with your finger tips so that it is flush to just below flush.



Apply thin CA the full length of the spar...



... and cure with kicker.



If you have not already done so, create a model in your transmitter. Aircraft type as shown above is the one to use for the DX9.



Once the program is created, and again if not having done so yet, test all the electronics. This is important to do BEFORE anything is installed.





With the servo electronically centered, attach the horn as shown. Do the same with the other servo, just make it an opposite hand configuration.



If using the recommended size servos, the cut out should be close to the right size, slits for the servo ears will need to be added though.



Adjust the size of the cut out if necessary and create two slits in the correct location to receive the servo ears.



Tuck the servo into the hole. Note - no glue at this time. That will be done in a later step.



Repeat for the other side.



Using a straight edge, cut a slit just deep enough to accept the servo wires. The slit you cut should run directly from the servo to the receiver bay as shown.





Repeat for the other side.



Now with some Low Temp hot glue, add a small bead of glue around the perimeter of the servo where it meets the cutout in the foam. Do this for both servos.



Locate the control surface horns and separate them from each other.



Locate the slit in the control surface for the horn by using a straight edge and small builders square. The slit should be in line with the servo horn and perpendicular to the main spar.



Test fit the horn into the slit. Note that edge of the horn should be flush with the under side of the control surface and the hole in the horn should be directly above the hinge line.



Once you are happy with the fit, remove the horn, and with the nozzle of the Welder's tube, force some glue into the slit.





Also apply a skim coat of glue to the area of the horn that will be embedded.



Install the horn as per the fit up you just did, wipe away any extra glue and repeat the whole process for the other side.



Next we build the control rods. Locate the rods and the brass threaded ends.



Make sure the threaded end slides over the control rod and fully engages.



Apply a drop of thin CA at the opening of the threaded rod and allow it wick inside the opening. Hit with kicker.



Repeat the process for the other control rod.





Locate two of the plastic clevis ends.



Screw the clevis onto the brass threaded end... leave about 1/8" of the threads exposed.



Next, determine how much to cut off by measuring from the hole of the servo to the hole in the horn. Make sure both are centered. Your Build may be slightly longer or shorter



In this case, it will be necessary to remove about 1/8" from the length. Ideally the rod extends into the hole of the clevis to the end of the solid portion.



After trimming the rod, double check the length and then secure the clevis to the rod with medium CA or Epoxy. Repeat the process for the second control rod.



Using one of the small brass pins, attach the rigid clevis end of the control rod to the control surface. Install from the side with the larger hole and fully seat the pin with needle nose pliers.





Before hooking up the other end of the rod to the servo arm, lay the trailing edge flat on the bench and adjust the clevis on the brass end to match with the outer most hole in the servo arm.



Once the clevis is adjusted, install the small brass pin, and like with the other end, the pin installs from the side of the clevis with the larger hole. Seat the pin

with a pair of needle nose pliers.



Repeat for the other side.



Locate the wooden motor mount as shown. Note that it may be laser engraved on one side, but it does not matter which way it installs.



Apply a medium skim coat of Welders to the mating area, located directly in the center of the trailing edge. There is notch in the foam to help with location.



Apply a matching medium skim coat to the narrower of the motor mount tabs. Let both pieces tack up for about 5 minutes.





Once the Welders it tacked up, attach the motor mount as shown.



Next is the small fuselage pieces. Split them at the thin area.



Then trim away any of the extra material so that the backs are flush as shown.



Test fit the bottom piece to make sure it fits flush to the motor mount.



Once happy with the fit up, apply a skim coat of Welders to the mating surfaces....



.... and let the glue tack up for about 5 minutes.





Once the glue is tack up, and starting from the motor mount surface, press the black piece against the motor mount....



.... and then working towards the nose, join the rest of it to the wing keeping it all centered as shown.



There will be a little extra, that can now be trimmed away.



Flip the wing over and test fit the smaller upper black piece to the motor mount as was done with the lower piece and apply a skim coat of Welders to the mating surfaces.



Once the Welders has tacked up. Join the two pieces together.



As with the lower piece, make sure and get the upper piece installed right down the center as shown above.





Next, locate the motor, ESC and motor mounting hardware. Decide where you want to locate the ESC, ie, top, bottom, left or right. In this build bottom left will be the location.



Mount the motor and attach the ESC with some low temp hot glue or velcro.



This is also a good time to plug in the servo wires and mount the receiver.



Tuck all the wires away into the provided foam pocket.



Battery compartment latch and cover is next. Locate the items pictured above.



Test the fit of the latch plate and note that the top and bottom surfaces should be flush with the upper and lower wing surfaces, but still allow access to the area with the cut out.





Once happy with fit up, apply some Welders to the mating surfaces and install the piece while the glue is still wet.



Check for alignment and position. As shown above, surfaces should be flush and access to the slot should not be blocked.



Put a skim coat of glue on the plastic nut, and a little glue on the sides of the hex cutout where you can reach with the nozzle. Note... just a small amount of glue is all it needs.



Press the nut so that it is just flush with the wing surface and wipe away any extra glue.



Fins are next. Note that the inner fins are not symmetrical from top to bottom.



There is more of a curve to the shape of the cut on the top side as comparted to the bottom side. These cuts are to match the profile of the wing core at the position they are installed.





Test fit the inner fin so that you can see how it engages the notched areas of the wing, then remove and add a small bead of welders to the area of the wing were the fin contacts.



While the glue is wet, spread the fin and engage the tab and slot areas. Press everything together a couple times to make sure there is a good bond.



Make sure the fine is straight and perpendicular as shown above.



Repeat the process for the other fin.



Tack up method will be used for the side fins. Apply a medium skim coat of Welders to the end of the Wing...



.... and a matching medium skim coat to the mating area of the fin. Make sure you do a left and right.





Once the Welders has tacked up, attach the fins to the wing tips by lining up the bottom edges as shown.



Check the CG. Twisted Hobbys' CG machine shown here, but you can also use your finger tips. CG is 6.50" from the tip of the nose or 2.70" from the motor mount forward.



Charge some batteries, balance some props, double check radio program and make sure that all the control surfaces are going the right direction.



BASIC FLIGHT CONFIGURATION 3s/850mAh Battery

Gives good CG and great duration for everyday flying.



MOBIUS FLIGHT CONFIGURATION 3s/450mAh Battery

Gives good CG, average flight duration and HD Video footage.



FPV FLIGHT CONFIGURATION 3s/600mAh Battery

Gives Good CG with light weight FPV gear and great for FPV Action.



C.G. - 6.50" from nose of aircraft



Locate all the electronics to achieve indicated CG point. For best performance, balance for level flight upright at 3/4 throttle and about 10% to 15% elevator push when inverted. Power off down line should be such that it will slowly pull into level flight. This is because the Flying Wings need some "reflex" (up elevator) for stable flight.

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Extreme Flying

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

<u>Beginner</u>

Ailerons - approx +/- 10 deg Elevator - approx +/- 10 deg Expo to suit

FPV & Sport Ailerons - approx +/- 15 deg Elevator - approx +/- 15 deg Expo to suit

In order to achieve the control throws as described for "Extreme", it is imperative that the control surfaces, linkages, rod ends, etc, all move freely over the entire range, including range end points. Set Absolute Travel if your radio has it.

Failure to do these things could result in damage to either the servos or mechanical components.



ING THESTING

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

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

STORAGE

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

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



NOTIES AND S/U SHEET

Setup Sheet
Transmitter - Receiver - Model
Weightgoz
CG Pointmm from wing leading edge
timermin
Travels and Exponential Electronic Components
low rate high / 3D
right aileron up - Aileron Servo -
right aileron down - Rudder Servo -
left aileron up - Elevator Servo -
left aileron down -
aileron expo -
rudder right - Battery -
rudder left - motor -
rudder expo - ESC -
elevator up - Propeller -
elevator down -
elevator expo -



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.

